MILL SECTION of

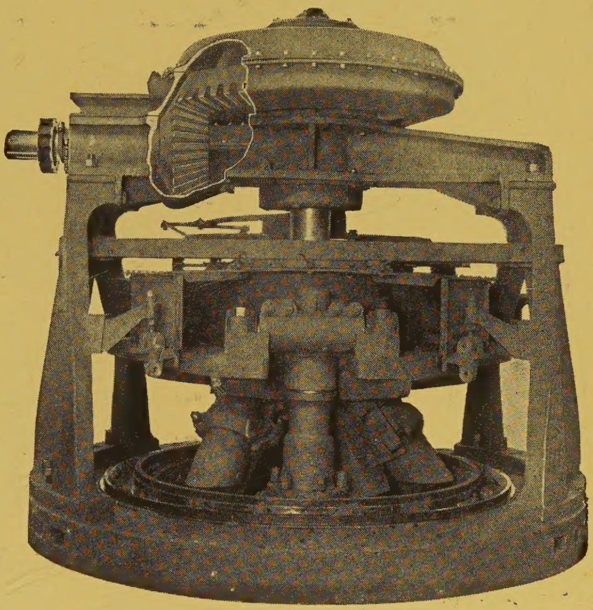
Concrete

ECONOMY
in Double Stage Reduction

FINER grinding of cement rock and clinker is the order of the day. How to secure the desired results with the greatest efficiency and power saving is a problem with which every cement manufacturer is confronted.

Two stage reduction, accomplished with BRADLEY HERCULES MILLS working in connection with tube mills, provides the most practical and economical means of reducing cement materials to the desired fineness. The cost for power is *less* than for any other combination of grinding mills from which the same results may be obtained.

Let us tell you how the Bradley Hercules can be profitably adapted to your own grinding problems.



The Bradley Hercules Mill

For grinding agricultural limestone, asphalt filler, coal, gypsum and all other non-metallic mineral, investigate the

GRIFFIN MILL,
BRADLEY THREE-ROLL MILL AND
BRADLEY PNEUMATIC MILL—

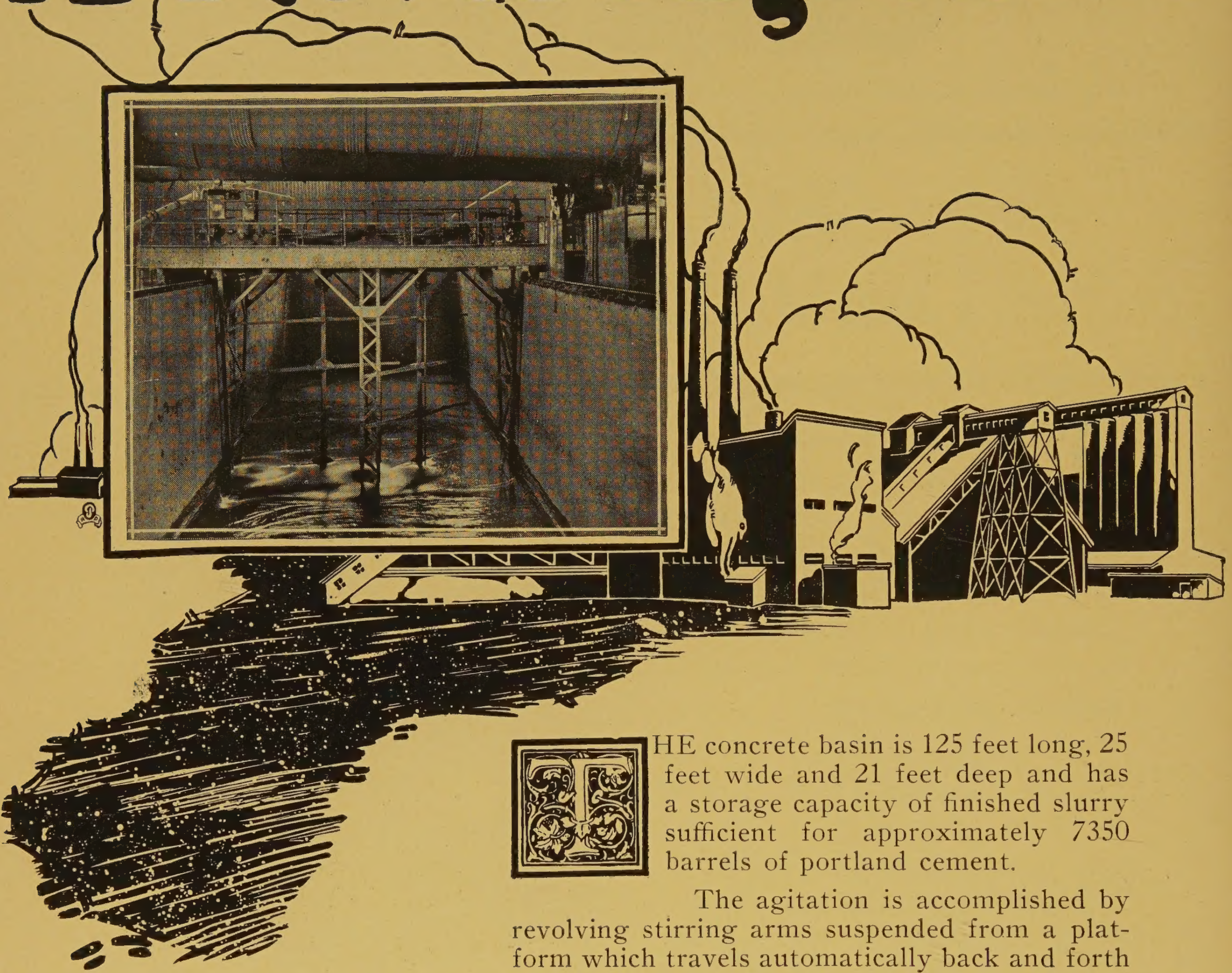
all of which are widely used for these purposes.

BRADLEY PULVERIZER COMPANY

Boston London Works: Allentown, Pa.

Index to Advertisers on Page 99 of This Section

A Novel Agitator



Cement Slurry Storage Basin
with
Traveling Agitator
installed at the plant of
Glens Falls Portland Cement
Company,
Glens Falls, New York

THE concrete basin is 125 feet long, 25 feet wide and 21 feet deep and has a storage capacity of finished slurry sufficient for approximately 7350 barrels of portland cement.

The agitation is accomplished by revolving stirring arms suspended from a platform which travels automatically back and forth along the basin. Air is also injected into the mix through nozzles on the stirring arms.

All operating and control machinery is mounted on the traveling platform. Two motors are required, a 10-horsepower for the agitators and a 5-horsepower for the travel.

The advantages of this agitator over the usual design for same capacity are lower first cost, saving of considerable power (about 50 to 60 horsepower), reduction in upkeep and repair costs.

F. L. Smidth & Co.
(Incorporated 1895)
ENGINEERS
50 Church Street Designers and Equippers of Cement Making Factories **NEW YORK**
Factory, Foundry and Laboratory—Elizabeth, N. J.

Index to Advertisers on Page 99 of This Section

MILL SECTION of Concrete

The Cement Mill Edition of Concrete is edited exclusively for those interested in the manufacture of cement. Its pages are devoted to discussions of plant design, management, operation, production efficiency, chemical research and control, quarry operation, progress and news of the industry.

The Cement Mill Edition also contains all the material published in the corresponding Regular Edition and so provides news of the uses and merchandising of the materials whose manufacture is discussed in the Mill Edition. The Regular Section furnishes mill operating officials and mill executives valuable points of contact with the users of the materials they produce.

Volume 32 May, 1928 Number 5

CONTENTS

New Volunteer Plant Designed and Equipped for Economical Operation—*(Illus.)* 101

A description of some of the high spots in the mechanical equipment and layout of the new plant of the Volunteer Portland Cement Company near Knoxville, Tenn.

51st Annual Convention of the Association of German Portland Cement Manufacturers 107

German cement manufacturers gather at Berlin to discuss chemical and operating developments in their industry. Some new data on the constitution of portland cement was presented.

Production of Magnesite in 1927 110

An Electrical Method for Measuring Setting Time of Portland Cement—*(Illus.)* 111

A Japanese investigator perfects a method for measuring the change in electrical resistance which occurs during the setting and hardening of portland cements.

Cement Statistics for March—*(Illus.)* 114

Editorial 115

The June No-Accident Campaign.
H. A. Schaffer.
"Chain Store" Cement Plants?

Men and Mills—*(Illus.)* 116

Presenting news about some important new mergers.

Mill Equipment 119

With the Manufacturers 120

In the Construction Section

Cement manufacturers will find much of interest to them in the construction section of this issue in which will be found articles on the uses of cement.

This month we present several articles on products manufacture, another one of Prof. Griffith's simplified design charts, an abstract of a paper presented by Mr. Hart on the architectural possibilities of concrete, an editorial on modern cements and other material for the concretor.

Copyright, 1928, Concrete Publishing Company

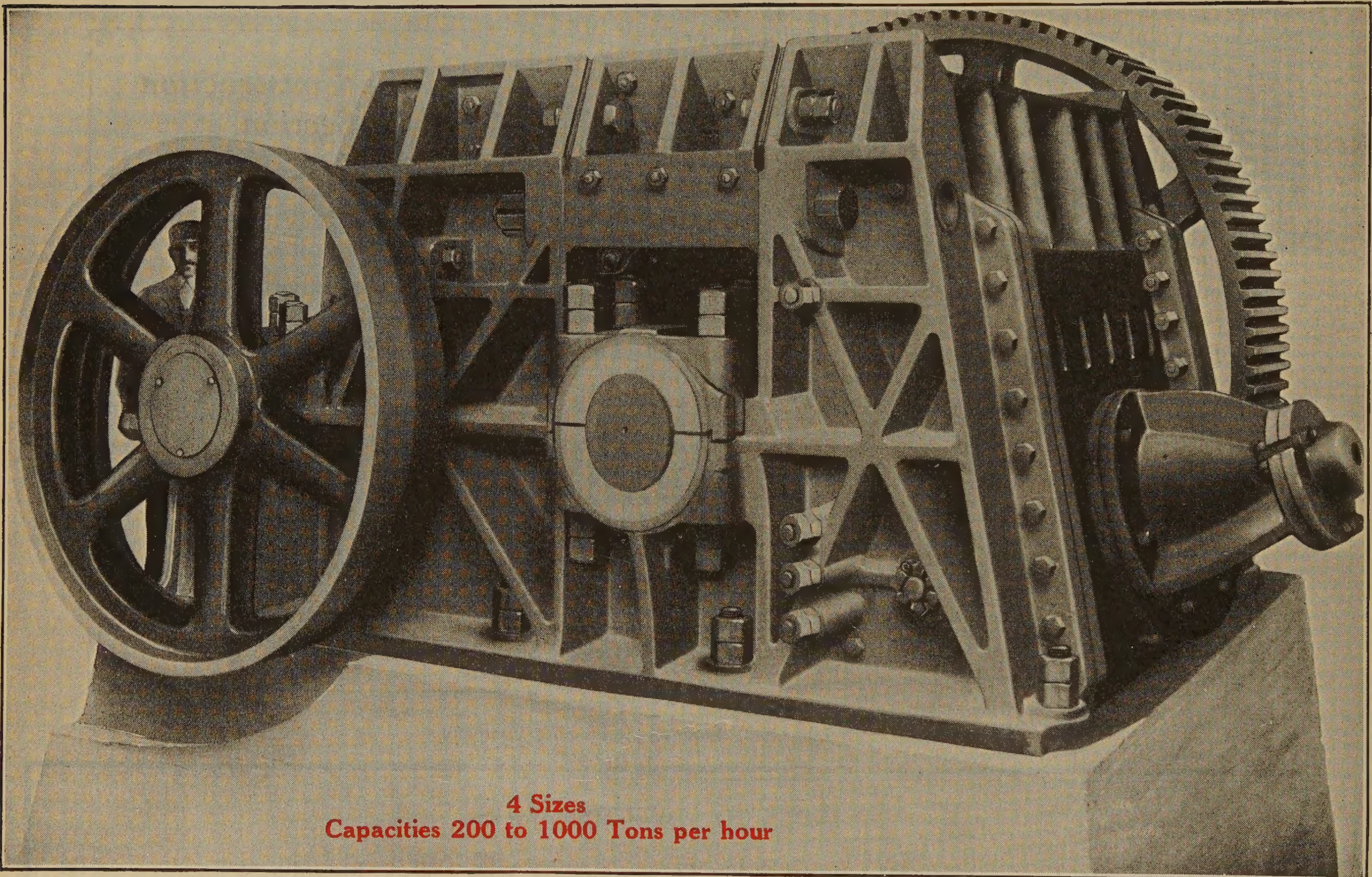
INDEX TO ADVERTISEMENTS

Allis-Chalmers Mfg. Co. 122
Babcock & Wilcox Co. 128
Baker & Spencer, Inc. 134
Bradley Pulverizer Co. 97
Burrell Engineering & Const. Co. 137
Caldwell, H. W., & Son Co. 133
du Pont de Nemours & Co., Inc., E. I. 123
Edge Moor Iron Co. 131
Engineering & Designing 134
Foster Wheeler Corp. 135
Fuller Co., The 129
Goodyear Tire & Rubber Co., Inc. 130
Haynes Stellite Co. 125
Hunt, Robert W., Co. 94
Huron Industries, Inc. 132
International-Combustion-Engr. Co. 121
Jones Foundry & Machine Co. 138
Keystone Driller Co. 137
Kritzer Co., The 134
Ladd Water Tube Boiler Co. 121
Latimer, Robert L., & Co. 136
Link-Belt Co. 126
Manitowoc Engr. Works 137
Meade, Richard K., & Co. 134
Pennsylvania Crusher Co. 100
Quigley Furnace Specialties Co., Inc. 136
Schaffer Poidometer Co. 135
Smidth, F. L., Co. 98
Sonntag, C. H. 134
Standard Oil Co. 124
Super Cement Co., The 96
Timken Roller Bearing Co., The Front Cover

Announcing the

PENN-LEHIGH ROLL

another "PENNSYLVANIA" *STEELBUILT* CRUSHER



4 Sizes
Capacities 200 to 1000 Tons per hour

The well-known advantages of the Single Roll Type, and the best developments of 30 years' experience, have been forged into the super modern design of the PENN-LEHIGH Roll,—putting at the service of the Cement, Lime and Gypsum Industries, Primary Crushers of enormous operating stamina and efficiency.

and now,—*PUT YOUR PRIMARY REDUCTION PROBLEMS UP TO US!*

Branch Offices:
New York Pittsburgh
Chicago Los Angeles

Associated with
PENNSYLVANIA CRUSHER COMPANY

General Offices:
Liberty Trust Bldg.,
PHILADELPHIA

Frazer & Chalmers Engineering Co., London
with Branch Offices in Principal Cities throughout the World.

MILL SECTION of

Concrete

Vol. 32 Chicago, May, 1928 No. 5

New Volunteer Plant Designed and Equipped for Economical Operation

Description of Equipment Details and Layout of New Plant of Volunteer Portland Cement Company Near Knoxville, Tenn.—Stone and Shale Pits Served by Same Transportation—Reduced Rehandling of Materials by By-Passing Storage—New Type Cooler Installed—Plant Layout—Operating Force to Include 115 Men

In a previous article, published in the January, 1928, issue of this magazine, a preliminary description of the new plant of the Volunteer Portland Cement Company about six miles east of Knoxville, Tenn., was published. This article presented detailed information regarding the raw materials to be used and the location of the plant.

The following article will continue this description by discussing the design and the mechanical features of the plant itself.

EVERY cement plant expresses in a large measure the objective and purposes of the men responsible for its design. This completed plant is the result of careful planning which included the general policies of the company as well as the detailed selection and arrangement of equipment.

Thus the new plant of the Volunteer Portland Cement Company near Knoxville, Tenn., is the result of a determination to build a mill that would permit the economical manufacture of a high quality of cement. This was the central purpose of the builders and all efforts and resources were directed toward that end. Rather than divert necessary capital to the construction of expensive buildings and accessories, the emphasis was instead put on the selection and installation of equipment that would best insure the results desired—the production of a quality product at a reasonable cost.

With this central idea in mind, the designers laid out a plant in which they expect to manufacture a million barrels of cement annually with an operating force of only 115 men, including the quarry force. Among the features of design making for economical operation is the fact that the material rehandling has been reduced to a minimum, as will be described later. Another feature of interest is the installation of a new type of cooler, the performance of which is expected to have a beneficial effect on clinker grinding operations. The fortunate locations of the stone and shale quarries, which permit the use of one system of transportation of the raw materials, also operate to reduce production costs.

Raw Materials

An abundance of raw materials of both the argillaceous and calcareous types is conveniently available to the south and west of the plant proper. A fortunate circumstance places the limestone deposit and the shale deposit in such a position that a single track can be used to serve both pits. Such a track, starting at the crusher house near the mill, will pass the shale quarry and serve the limestone deposit all within a distance of about 1700 feet. This quarry track, of standard gauge, will also be connected with the yard tracks. As previously mentioned, a detailed account of the raw materials available and their composition was published in the January issue.

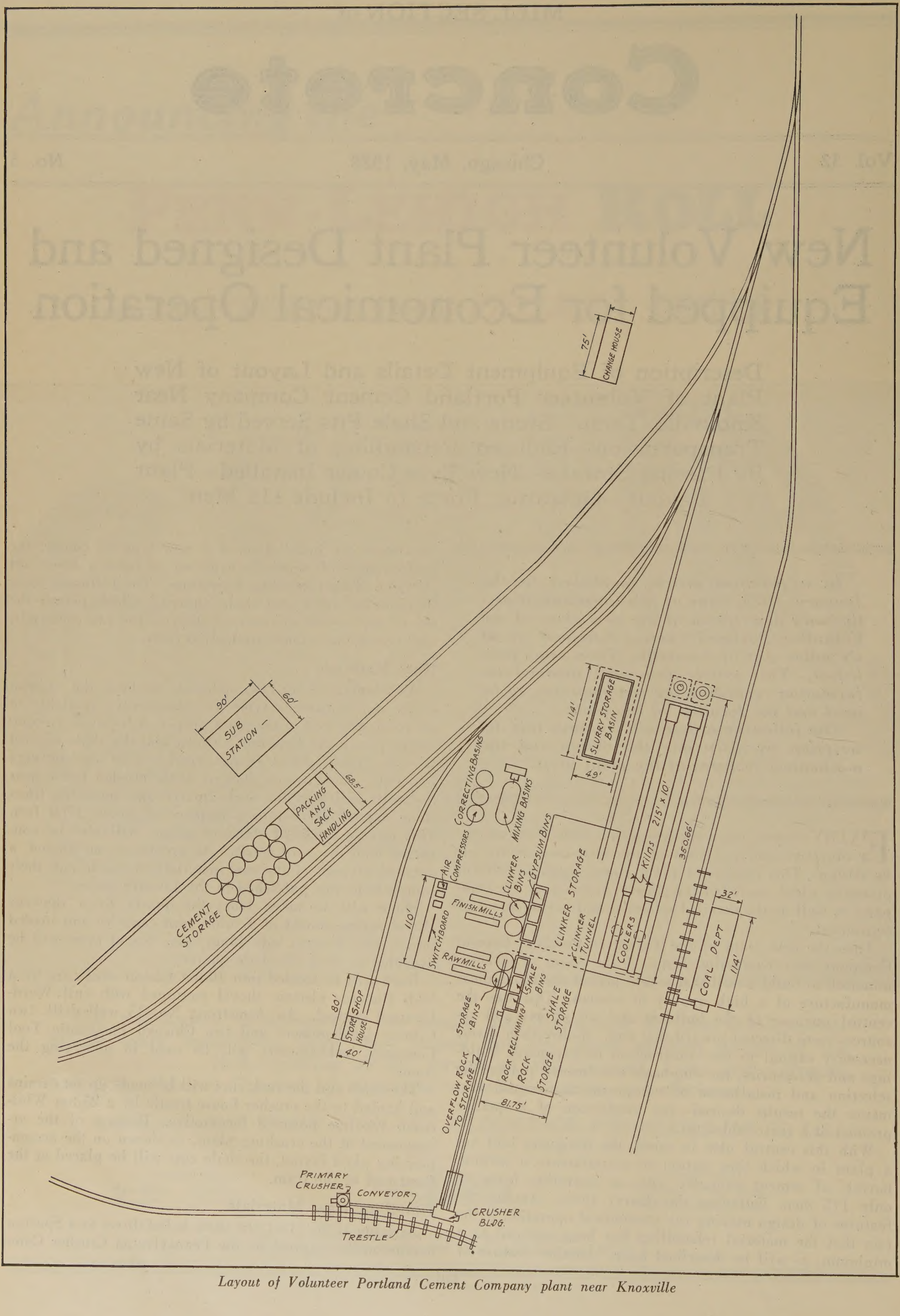
Shale will be taken from the quarry by a Bucyrus Diesel engine shovel of 1-cubic yard capacity and loaded into 6-yard Western side dump cars. Six of these will be provided to serve the shale quarry.

Rock will be loaded into 10-ton Easton steel cars by a 50-B Bucyrus electric shovel equipped with full Ward-Leonard control. An Armstrong No. 45 well drill, two Gilman jackhammers and two Chicago Pneumatic Tool Company jackhammers will be used in quarrying the stone.

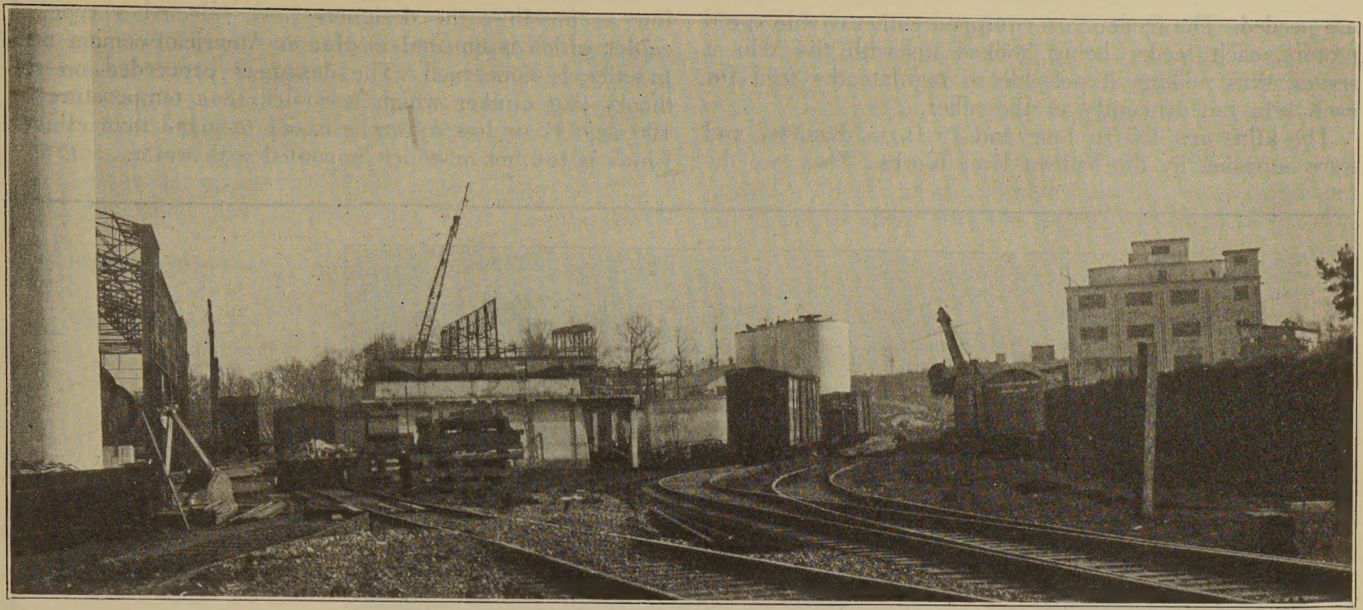
The shale and the rock cars will be made up into trains and hauled to the crusher house trestle by a 25-ton Whitcomb gasoline powered locomotive. Because of the arrangement at the crushing plant, as shown on the accompanying plant layout, the shale cars will be placed at the front end of the train.

Handling Raw Materials

Arriving at the plant, the shale is fed direct to a Sparton hammermill, supplied by the Pennsylvania Crusher Com-



Layout of Volunteer Portland Cement Company plant near Knoxville



General view of the plant looking east. To the right is the rock house, at the right center the slurry correcting basins and at the left is the kiln building

pany, where it is reduced to tube mill size. Leaving the hammermill, the shale is taken on a 24-inch Goodyear belt to storage.

The rock is dumped from the quarry cars directly into a 36-inch Superior McCully crusher (Allis-Chalmers Company) where it is crushed to 5-inch size. A 30-inch Goodyear belt conveyor then takes the rock to a Thor S x T 11 Pennsylvania hammermill housed in the same building as the shale hammermill. Here the rock is reduced to ¾-inch size and carried by a 24-inch Manhattan belt to the stone bins which feed the mills. This belt parallels the shale belt, as shown on the plant layout.

Materials Storage

In keeping with the policy of the designers to rehandle as little material as possible, only excess rock and shale are stored. Whenever possible stone and shale are taken directly from the hammermills to the mill feed bins, thus eliminating the necessity of rehandling this material from storage. Clinker, also, is fed directly from the coolers into the finish mill bins under average operating conditions.

Provision is made for diverting the overflow rock and shale into storage and for this purpose a material storage building, 330 feet long by 80 feet wide, has been provided. Approximately half of this building is reserved for clinker storage, the other half, except a small space set aside for gypsum storage, being used for excess rock and shale.

An 8-ton electric crane, furnished by the Milwaukee Electric Crane and Manufacturing Company, serves the storage building. The crane is equipped with a 2½-yard Williams clamshell bucket. Under the method of operating decided upon, the only duty the crane will be called upon regularly will be to handle the shale and gypsum to the mill feed bins and to store excess rock and clinker.

Grinding and Slurry Handling

Schaffer poidometers are installed under the shale and stone bins and it is here that the raw materials are proportioned. The poidometers discharge onto a Miag torpedo conveyor which takes the blended materials to the mill hoppers.

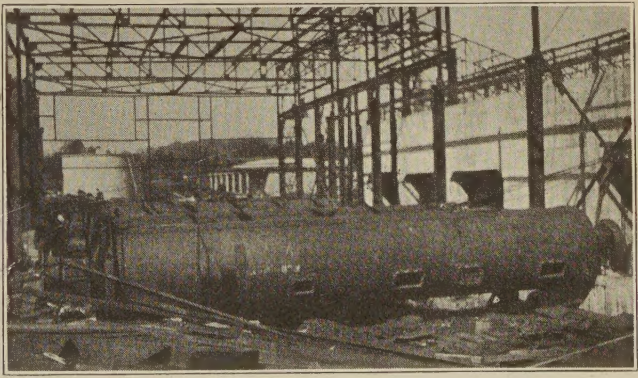
Water is added as the raw materials are fed into the two Unidan raw grinding mills. These mills, supplied by the F. L. Smidth Company, are of the 3-compartment type, 7 by 39 feet in size. They discharge into a trough which leads to a slurry sump from which a Wilfley pump transports the slurry to the correcting basins. There are three of these, each of 600 barrels capacity. From the correcting basins the slurry is fed by gravity into an 1800-barrel mixing basin where the final refinements in proportioning the raw materials are made.

Agitation of the slurry in the correcting basins is accomplished by F. L. Smidth triple agitators, while a quadruple agitator of the same type is installed in the mixing basin.

Wilfley pumps again take the slurry from the mixing basin to a large, rectangular 7000-barrel slurry storage basin, 100 by 35 ft. in plan and 20 ft. deep. An F. L. Smidth quadruple traveling agitator is installed.

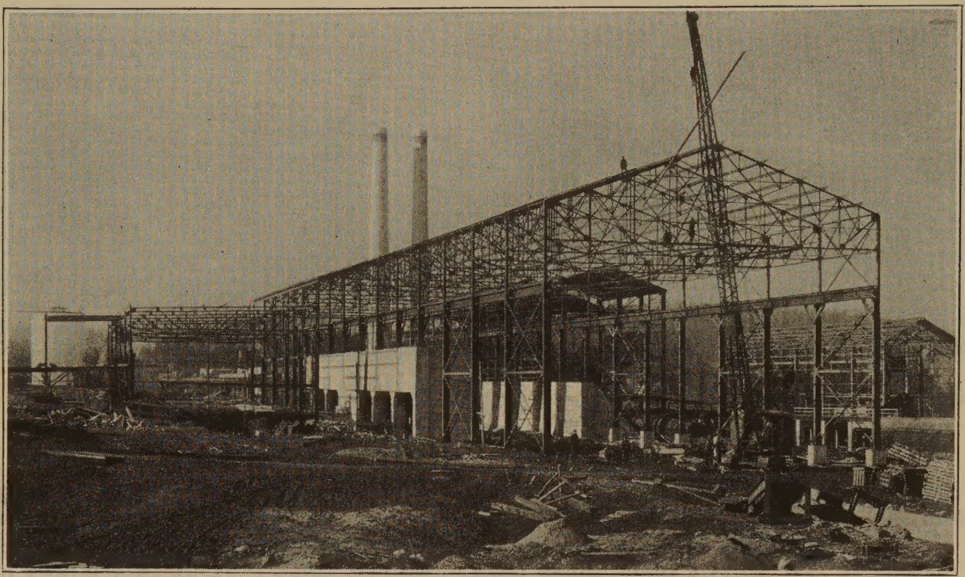
Kilns

The slurry discharges by gravity from the storage basin into a sump from which it is pumped to the kiln feed hopper. Here two Allis-Chalmers, Ferris wheel feeders, one for each kiln, regulate the supply of slurry to the kilns. Both of the feeders are placed in the single kiln feed hopper so that only one feed line and one overflow



The mill room from the raw end, showing the four Unidan 3-compartment mills, two for raw grinding and two for finish grinding are needed. The feeders are equipped with variable speed motors, each feeder being hooked up with the kiln it serves, thus making it possible to regulate the feed for each kiln independently of the other.

The kilns are 215 ft. long and 10 ft. in diameter and were supplied by the Vulcan Iron Works. They are the first kilns of this length made by Vulcan Iron Works for operation with single roll supports. Though only 30 h.p. is required to operate the kilns, 50-h.p. motors were installed.

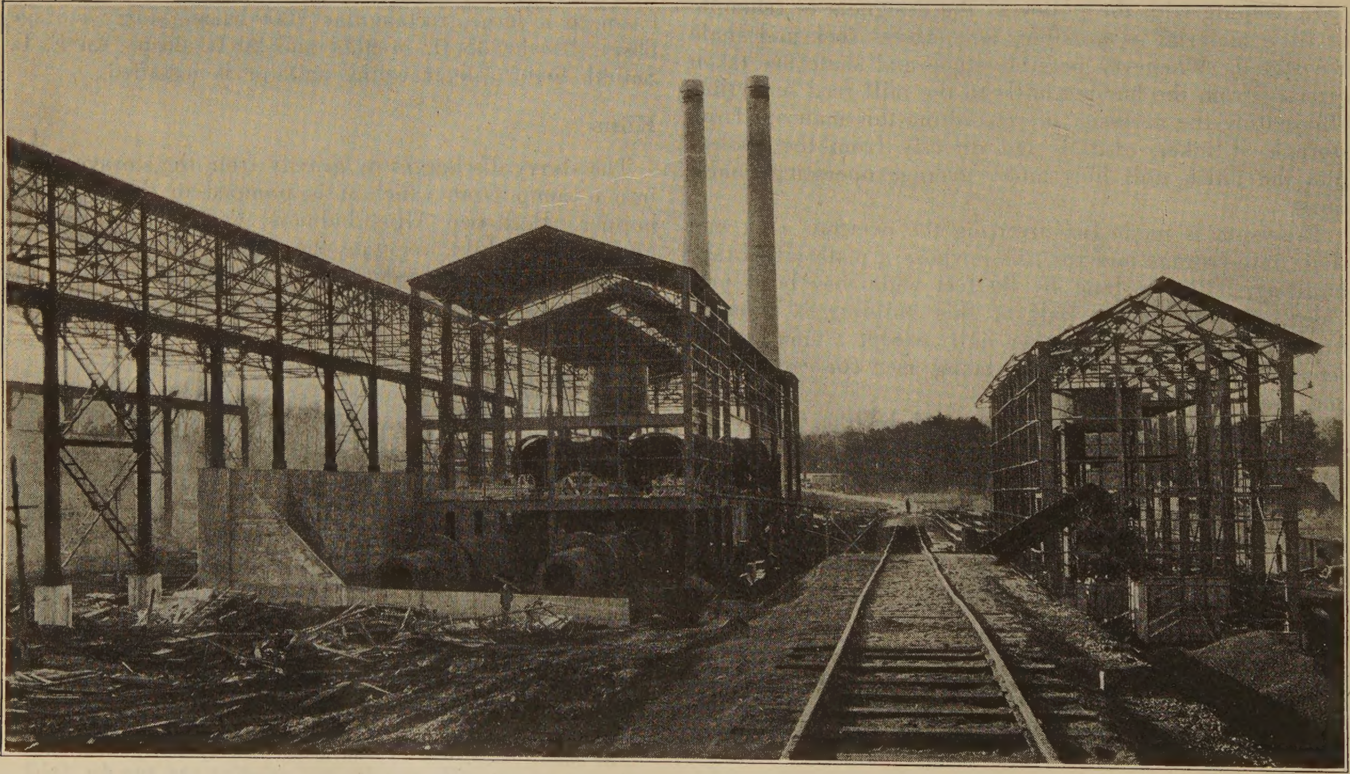


The materials storage building, showing the rock and shale bins. At the left is the mill building

Interesting Cooler Design

In line with their efforts to keep operating costs as low as possible, the designers have selected a type of cooler which is unusual insofar as American cement mill practice is concerned. The designers proceeded on the theory that clinker which is cooled to a temperature of 100 deg. F. or less *by air* is easier to grind than clinker which is too hot or which is cooled with water.

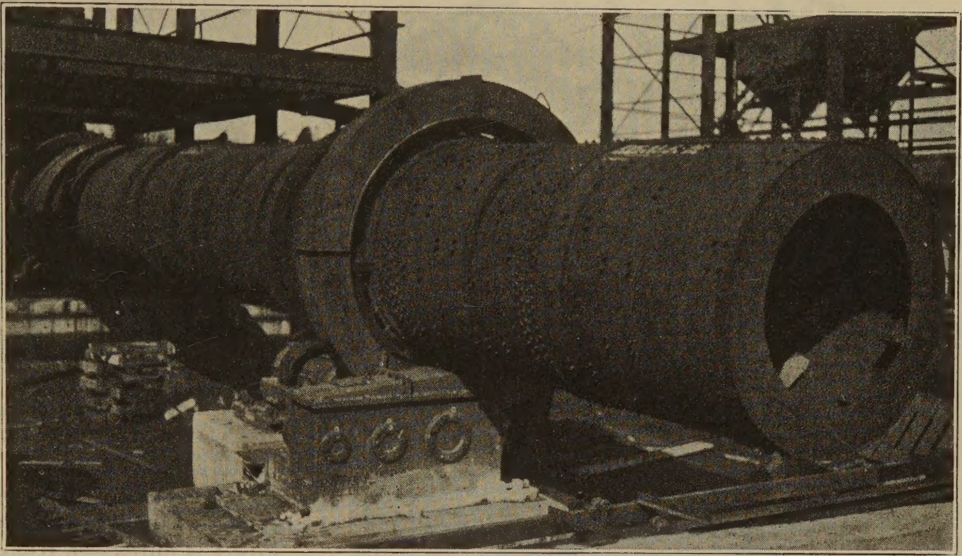
The shells of the coolers selected were made by the Traylor Engineering and Mfg. Co., while the rolls and interior fittings were made by the American Miag Corporation. They are 90 feet long by 8 feet in diameter. Coolers and kilns are joined with a tightly sealed hood so that all air for combustion, except that which is blown in with the coal, is taken through the coolers over the clinker.



The kiln building showing the installation of the kilns and the coolers. The coal building is shown on the right

It is estimated that the air blown in with the coal constitutes about 20 per cent of the air required for combustion, the remaining 80 per cent being preheated as it passes over the cooling clinker.

Leaving the kilns, the clinker discharges through the kiln hood into a special swinging chute which acts as an air seal for the upper end of the cooler. This chute can easily be swung clear of the cooler when for any reason it is necessary to shut the cooler down. When this is done, the hot clinker discharges onto a drag chain which takes it direct to clinker storage.



A close up of the installation of cooler No. 2

Under ordinary operating conditions, the clinker enters the cooler from the hood and passes through the upper half of the cooler which consists of a firebrick lined cylinder. Here the incoming air takes some of the heat from the glowing clinker.

Arriving at the center of the cooler, the clinker enters the disintegrating chamber where large lumps are broken up for more efficient cooling.

The disintegrating chamber is equipped with a series of breast plates, similar to those in a ball mill. A number of 3- or 4-inch steel balls are picked up on the breast plates and dropped on the clinker, breaking it into smaller particles. Across the lower part of the chamber is a special steel grating which retains the balls and the large lumps, but permits the fine materials to pass and does not obstruct the air coming through the cooler.

The lower half of the cooler consists of a series of spraying buckets which pick up the clinker and spray it into the current of air passing through the cooler. The cooler is so designed that a large section of it can be water-cooled from the outside if this is necessary to increase its cooling efficiency.

Finish Grinding

The cooled clinker discharges onto a Miag torpedo conveyor which takes it through a tunnel under the clinker storage to an elevator which places the clinker directly into the mill feed bins. The clinker elevator is of Chain Belt manufacture.

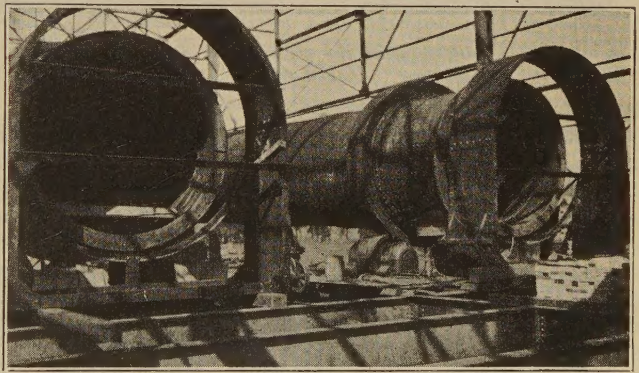
Gypsum is delivered into storage from an elevated track running into the storage building. The storage building crane then picks it up and places it into the mill feed bins from which it is proportioned into the grinding mill feed.

At the head of the clinker elevator there is an overflow chute which takes the excess clinker and deposits it in storage directly over the clinker tunnel.

When it is necessary to reclaim clinker from storage, gates are opened in the storage building floor, permitting the clinker to drop onto the torpedo conveyor in the tunnel by means of which it is again taken to the mill feed bins.

The clinker grinding mills are of the same type and size as the raw grinding mills previously described, as is also the mill feeding arrangement. As shown by the plant layout, both the raw and finish mills are housed in the same room.

A dust collecting system, designed and installed by the Northern Blower Company, is placed in the roof of the grinding department. It will collect the dust at all points where clinker and cement enter and leave the mills.



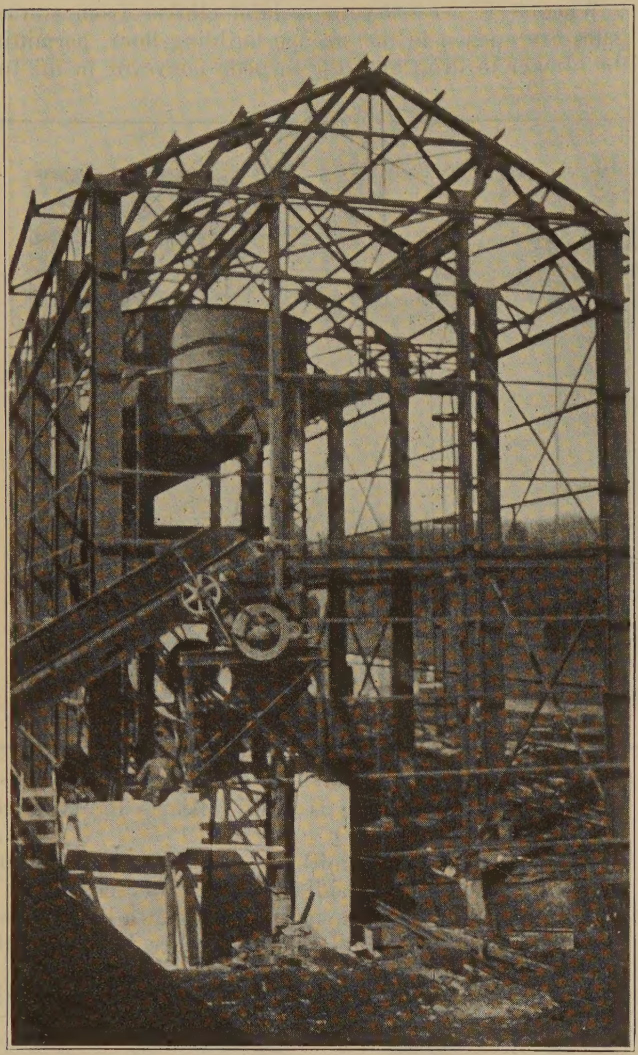
Installing the kiln hoods

Cement Storage

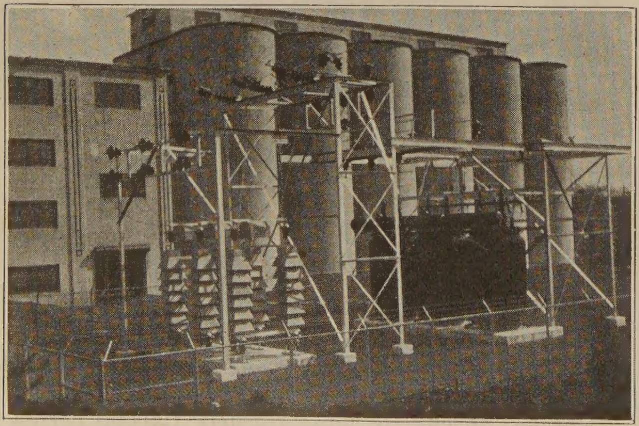
The finished cement is discharged from the tube mills into a short screw conveyor which takes it to a Fuller-Kinyon system for transportation to storage.

Storage capacity for approximately 100,000 barrels of cement is provided by the fourteen circular bins and the space between them. The storage silos are of reinforced concrete construction built by the Burrell Engineering and Construction Company.

Cement is drawn from the silos in the usual manner and taken to the packhouse, where four Bates packers are installed. Provision is made for both railway and truck loading. A Northern Blower Company dust collecting system was installed to keep the packhouse free from dust.



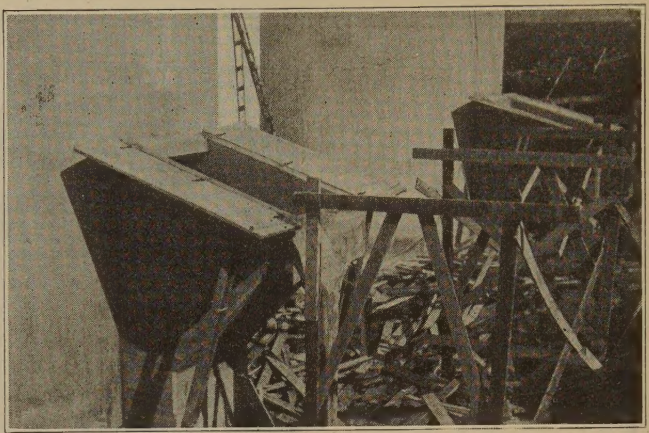
The coal mill, showing the crusher, the dryer and the coal feed tank



The substation south of the cement storage silos

Coal is received on a track trestle, as shown on layout and dumped into a track hopper. It then passes through a Jeffrey crusher and onto a feeder which delivers it to an elevator. The coal is then placed into a tank over a Fuller-Lehigh rotary dryer. After passing through the dryer, it is ground by two 48-inch Fuller mills and taken to the kiln feed tanks by a Fuller-Kinyon pump.

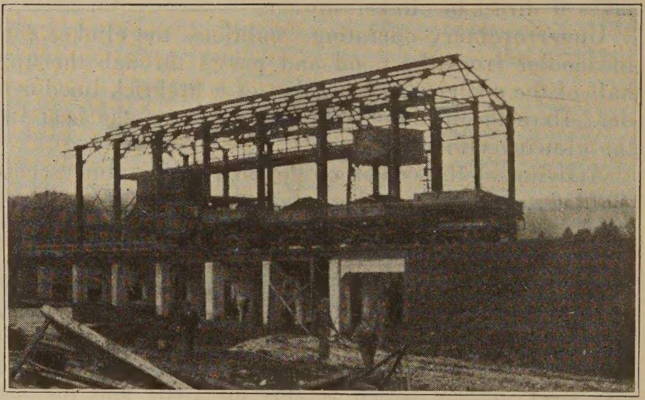
A Bailey feeder, made by the Fuller-Lehigh Company, is used on the kiln coal feed. This feeder absolutely regulates the amount of coal going to the kilns—an important feature in getting uniform clinker.



Stairs at the rear of the stock house

Power is purchased from the Knoxville Power and Light Company. It is brought to the company's sub-station where it is converted for use in the mill.

Two reinforced concrete stacks, 175 feet high and 9 feet in diameter at the top, were built, one for each kiln. They were so located that waste heat boilers may be easily installed if at any time it is considered desirable to do so.



The coal receiving trestle alongside the coal building

The main plant switchboard is located in an extension to the mill room. Here also are the air compressors. There are three of these—two of 500 cubic feet capacity and one of 1000 cubic feet capacity, all made by the Ingersoll-Rand Company. During the daytime, the plant will require about 800 cubic feet of 60-pound air and an equal amount of 100-pound air per minute. At night, about half this amount is sufficient.

The officers of the Volunteer Portland Cement Company are J. Ross Hanahan, president; J. Howell Davis, vice-president; E. Earl Evans, secretary and treasurer. Charles F. Lewis will be general manager of the company. The plant was designed and built under the direction of Major Frederick H. Lewis.

51st Annual Convention of German Portland Cement Manufacturers

Abstracts of Papers Presented—New Information on Alite—Chemistry of High Early Strength Cements—Report on Recent Researches—Porous Cement Products—Steam Curing of Test Specimens—Test Pats—Tube Mill and Shaft Kiln Development—Tranportation Systems for Cement

THE 51st annual convention of the Association of German Cement Manufacturers was held on March 14th and 15th in the large hall of the Association of German Engineers in Berlin. The sessions began by a word of greeting to the guests and organizations represented from the chairman, Plant Director Dr. Kneisel.

The fiftieth anniversary of the association was the occasion of a gift of 20,000 marks from Friedrich Schott. At five year intervals four-fifths of the accrued interest is to be awarded as a prize, in its entirety or in part, to persons foremost among those contributing to the progress of the cement industry. The funds may also be used for the improvement of the quality or reduction of the price of cement. One-fifth of the interest is to be added to the capital. The management and awarding of the prizes is entrusted to the president of the association, who is to consider the advice of university professors.

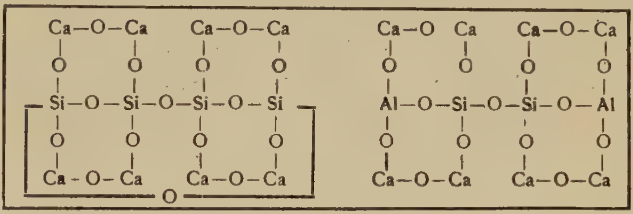
The gold medal of the association is also to be awarded every five years at the general convention.

The first paper was presented by Dr. Ernst Janecke, Heidelberg, and was entitled

Latest Knowledge Regarding Alite

Colored slides of thin sections of cement were shown as an introduction. The speaker then pointed out that years ago he established the formula $8CaO.Al_2O_3.2SiO_2$ for the main constituent of cement, the so-called alite. To confirm this, tests were made to produce Sr-alite and Ba-alite. The melts actually showed alite as the predominant constituent, Ca-alite existing alongside of β-$CaO.SiO_2$, CaO, $3CaO.Al_2O_3$. Similar compounds were established for Sr and Ba. The melts also contained glass. The presence of five compounds instead of three in a three-component system proves clearly that we do not deal here with a condition of equilibrium. The observed quantities can only be explained by a ternary compound and not by the assumption that alite is $3CaO.SiO_2$. X-ray photographs were then made in accordance with the Debye-Scherrer method. These disclosed the remarkable evidence that alite and dicalcium-silicate (belite) have identical interference. This was explained by similar constitution, that of belite being $Ca_8Si_4O_{10}$ and of alite $Ca_8Si_2Al_2O_{15}$.

The substitution of Al for Si in silicates with formation of similar compounds is frequently observed in nature, for example, in augite, hornblende and triclinic feldspar. The speaker then demonstrated the fusion and crystallization processes. These stand in perfect agreement with all observations made to date. The peculiar nature of the fusion diagram explains why alite and belite exist independently without forming mixed crystals. The hypothetical tricalcium silicate does not exist as a compound. It was never observed in the binary mixture. When Al_2O_3 is present, the result is alite and not $3CaO.SiO_2$. Neither do the SrO and BaO silicates form a compound with a molecular ratio of 3:1. The result was confirmed through investigations of various melts. The speaker then referred to the part played by iron in the clinker. He showed that "iron alite" was non-existent. Photomicrographs of two thin sections, of which one was "iron alite" and the other Ca-alite, showed clearly that the mixture $8CaO.Fe_2O_3.2SiO_2$ contained β-$2CaO.SiO_2$ and not $3CaO.SiO_2$. Reference was made to recent investigations which claim to have established a compound $4CaO.Al_2O_3.Fe_2O_3$, which must represent the alite of cement.



The second part of the paper dealt with compounds formed during the setting and hardening of cement. It was shown that the hydrates forming are $Ca(OH)_2.2CaO.SiO_2.H_2O$ and $2CaO.Al_2O_3.6H_2O$. Setting was explained by the reaction of water mainly with alite; hardening by further reaction with belite. In dealing with alite, account should be taken of $2CaO.Fe_2O_3.6H_2O$. Recent tests of the systems $BaO.Al2O_3.H_2O$ and $CaO.Al_2O_3.H_2O$ were quoted.

In the discussion that followed, Dr. Kuhl welcomed the admission made by Prof. Janecke, that alite is not only $8CaO.Al_2O_3.2SiO_3$, but may consist of mixed crystals. He also stated that "Erzzement" (iron cement) contains no alumina, yet shows the presence of alite. For this reason Dr. Kuhl is of the opinion that tricalcium silicate, whose presence is denied by Janecke, must be present, and that alite is a mixture of tricalcium silicate and Janeckeite. In replying, Prof. Janecke claimed that Erzzement contained appreciable quantities of alumina, so that Dr. Kuhl's argument was not well-grounded. Dr. Nacken also questioned the existence of tricalcium silicate in the discussion that ensued.

Prof. Dr. Hans Kuhl had for his subject

The Chemistry of High Early Strength Cements

Though progress in kiln and mill design has greatly favored the manufacture of high early strength cements, the chemical standpoint should not be overlooked. The

---

*Translated from reports of the meeting appearing in Tonindustries-Zeitung and Zement.

two main chemical groups of factors are: control of the chemical composition of the raw mix and use of such chemical means as are capable of raising the hardening activity of clinker. The best strength values are obtained with Velo-cements high in silica, as well as with cements very low in silica, such as Bauxitland, but not with those of a medium silica content. Velo-cement has an artificially raised silica modulus of 3 to 4 with a hydraulic modulus of 2.3; Bauxitland cement a silica modulus of 1.25 with a hydraulic modulus of only 2.0, but with a high iron content of 6.5 per cent and 8 per cent Al_2O_3. Cements low in silica require no specially fine grinding of the raw mix nor of the clinker. The material sinters easily showing a tendency for ring formation in the rotary kiln and baking in the shaft kiln.

The raw mix may be influenced by the use of fluxing materials such as fluorspar or calcium chloride.

However, the hardening energy may be influenced favorably even subsequent to calcination, the rise in initial strength being particularly useful. Our knowledge of the chemistry of blast furnace slag teaches us that the rate of hardening may be greatly intensified by physical as well as by chemical means. Clinker differs from slag in that it is not fused, but assumes a predominantly crystalline state during sintering. Portland cement clinker cannot, therefore, be as strongly affected as blast furnace slag. Nevertheless, previous experience holds true, and rapid calcination and rapid cooling improve the quality of cement.

Among the admixtures, calcium chloride has a still more pronounced effect than gypsum. When used in certain concentrations, it reduces the time of set considerably. As chlorine is obviously the active constituent, the speaker attempted to add chlorine to cement in such a way that its action would become apparent only after a certain time. A large number of chlorine compounds were used, though no practically valuable results have as yet been obtained. The tests were extended to include compounds other than chlorine. A most marked rise in strength was produced with calcium chloride and calcium nitrate. The tensile strength was raised by 20 per cent at 2 days; the compressive strength by 50 per cent. The final strength remains unaffected.

The chemistry of high early strength cements has its negative side. A tendency is observed to combine cement manufacture with other industrial processes. The chemical industry has succeeded in making practical the manufacture of portland cement from gypsum in connection with the sulphuric acid industry. The large quantities of residue remaining in the processing of nitrogen compounds from calcium nitrate and in the production of acetylene from calcium carbide cry out for utilization. Attempts are being made to produce a fused cement from phosphates with coal and bauxite. The difficulties to be overcome still seem too great. The cement industry is ahead in this competition, as it can work on improvement of its product, while the chemical industries are doing away with detrimental conditions.

The third scientific paper was presented by Dr. R. Nacken, Frankfurt a. Main.

Report on Recent Researches

The speaker repeatedly emphasized the importance of starting out with pure synthetic compounds in studying the constitution of cement clinker. He described a method which yields calcium silicates and presumably calcium aluminates as crystallized products. It consists in permitting these to crystallize from proper salts at high temperatures. He then reviewed the results of latest researches on the constitution of cement clinker, accompanying this review by numerous diagrams. Comparisons of fusion diagrams show frequent agreement in the behavior of silica systems with oxide of bivalent metals, such as calcium, magnesium, barium, strontium, manganese, iron and lead. Nevertheless, a similarity of the formula structure does not always indicate similar physico-chemical behavior and generalizations are to be avoided. Characteristic is the fact that calcium metasilicate and strontium metasilicate are perfectly capable of mixing, while calcium meta silicate and barium meta silicate do not mix in the crystalline state. A report was made on alkali silicates. Investigations of the structure of the main constituents of clinker were described. The lengthy x-ray studies and the determination of certain optic constants must be first carried out on the simple components in a pure state, before such investigations can be extended to the complex systems of cements. The computation of characteristic constants of molecular structure was indicated.

In conclusion, the speaker referred to unsoundness. This undesirable feature of certain cements is not caused by the stresses induced during crystallization of newly formed double compounds and hydrates, as they do not exist. The explosive action of so-called unsoundness phenomena is of a purely capillary nature. The only way of avoiding these is to exercise great care in the manufacture and uses of cement. This obviates the possibility of local surplus of chemical substances which are capable of reacting with water, sulphuric acid and other substances.

Dr. Julius Meyer, Breslau, reported on

Porous Cement Products

The problem of porous cement and cement products, which has been much talked about in recent years, attempts to combine the advantages of cement and brick, at the same time eliminating the disadvantages of both. The advantages are: considerable saving of materials, low unit weight, reduced heat and sound conduction, possibility of driving nails, saving of labor and better distribution of labor, as well as simplified building methods.

The manufacture of porous products should conform to certain requirements, which have not always been satisfied in the past with the result that the introduction of these products was handicapped. The process must be simple and easy enough to be carried out on any job without special machinery by any skilled laborer. The materials must be cement, sand, coarse aggregate, as for concrete. No admixtures should be used, as they alter the composition and affect detrimentally the good structural qualities. The process used in producing the pores in the material must yield uniform results, so that the products can be reproduced in a series.

The manufacture of porous materials from cement is based on two principles: artificial production of a porous foam, which is subsequently treated with cement, etc., and made to harden in this condition; manufacture of a material containing cement, in which pores are produced in an artificial way. While the first process may be used only in plants provided with adequate machinery and cannot be carried out in the field, the latter method may be used much more extensively, and presents a problem only in the search for an adequate means of producing porosity in the plastic mass. Various substances of such nature have been suggested, yet each one possesses some undesirable quality which has prevented its introduction in practice. The substance must react with water alone producing gas evolution and should have no effect on cement. Thus aluminium reacts with the lime of the cement and requires even an admixture of lime, particularly in mixes rich in sand. The substance added must yield to very fine pulverizing, as this is a requisite for the high pore volume of the product and for its insulating properties. The rate of reaction of such a substance must be such that it is completed when hardening of the plastic mass sets in. If gas evolution continues upon hardening, the mass does not become porous but crumbly and its compressive strength becomes reduced. This is the case with aluminum admixtures. Neither should the interval between completion of the gas evolution and beginning of hardening be too long, as the plastic mass would fall and the gas escape. Thus metallic calcium results in too quick a reaction producing coarsely porous products, as it cannot be pulverized to sufficient fineness.

The study and analysis of these conditions led the J. G. Dye Company (J. G. Farbenindustries (A.-G.) to the discovery of a material possessing all desired properties. Its use is most simple, small quantities of this material (0.1 to 0.25 per cent) being added by hand or in the mixer to dry cement-sand mixtures of the usual proportions of 1:4 to 1:7 with possible admixtures of coke cinders and other materials. Water is added until a fluid paste is obtained, which is filled in molds, the latter receiving a volume of paste of 70 to 80 per cent of their capacity. According to the nature of the gas producing medium, the molds are filled to the brim in one half to three hours and their content is allowed to harden.

The most important property of the porous products obtained in this manner is their weight, which may be altered at will from 400 to 2000 kg. per cu.m. The factors controlling the unit weight are the quantity of gas producing substance added and the ratio of cement to other materials (sand, coke cinders, kieselgul, etc.) It appears that, independent of the material employed, certain weights produce definite compressive strengths. Therefore, porous products weighing less than 800 kg. per cu.m. cannot be expected to yield strengths required for structural purposes. The heat insulating and soundproof properties of the products depend, aside from the weight of the product, also on the volume of pores. The finer the pores, the better the insulating capacity of the product. Porous products obtained in this manner permit the driving of nails and are also adapted for reinforced lightweight concrete products, as the steel is protected against corrosion as effectively as in massive concrete.

In conclusion photographs were shown of the manufacture of cubes of light-weight concrete and of the building of a dwelling house. Samples of porous concrete and insulating material were exhibited.

Steam Curing of Test Specimens

Dr. Biehl discussed the steam curing of standard test specimens for the determination of 28-day strengths and strengths at 48 hours. Starting out with Erdmenger's tests, investigations were carried out to obtain rapid strength determinations by exposing the test specimens to steam pressure. Tables and diagrams were shown, illustrating the relation of compressive strength to time of exposure and steam pressure. The values of the standard 28-day tests were reached in some cases, others remaining below. It was pointed out that depending upon the period of steam curing and the height of steam pressure, the strengths already obtained may lead to complete destruction of the specimens. The speaker emphasized that this method was adapted only for use in the laboratory.

Prof. Probst chose the subject of "Mortar and Concrete." Numerous slides were shown to demonstrate the advantages of correct grading and quantity of mixing water. The speaker pointed out that concrete used for road construction should have as low an absorption as possible, referred to the uses of gravel and crushed stone concrete and discussed the familiar formulas for the predetermination of concrete strength.

Prof. J. Meyer reported on his tests with gas concrete "Schima." His statement with regard to difficulties still encountered in practice with gas or cell concrete, were contradicted by Dipl. Ing. Fraenkel, who gave a demonstration of slides showing whole residences, railroad stations and industrial plants erected of this material in Sweden, Norway and other countries. Dipl. Ing. Luft emphasized the advantages presented by porous concrete for the building of residences.

Director Dr. Ehrhart Schott quoted interesting data on "Crack Formation in Glass Plates Due to Test Pats." Numerous illustrations were shown to prove that shrinkage of cement was not responsible for cracks forming in the glass plates. Various kinds of glass were investigated, the Schott and Gen., Jena products ZK 7 (6367) and BaK 4 (7550) showing no crack formation. In comparing the physical properties of different kinds of glass, it appeared that the coefficient of expansion of the glass played no part in this connection, but that a certain relation seemed to exist between the tensile strength of the glass and its tendency to crack.

Justizrat Dr. Fuld presented a paper on "Cement Nomenclature from a Legal Standpoint."

Tube Mill and Shaft Kiln Development

Director C. Mittag discussed the operation of tube mills. Numerous slides were shown to illustrate the milling process. The effect of moisture of the material and of the shape of particle was studied. Curves were determined for tube and drum mills. The effect of power consumed on increased fineness was investigated, also the distribution of fineness through the different chambers of the mill.

The development of the automatic shaft kiln was the subject presented by Dr. Pollert. The evolution of the discharge, loading, etc., was sketched. Of interest were the statements concerning increase of capacity due to more rapid burning. Data were given of the operation of kilns with down draft and a series of nozzles. Air, specially preheated, was introduced below the burning zone through tangentially located nozzles. Distribution of the draft means considerable power economy.

Transportation Systems for Cement

The use of the Fuller-Kinyon transport systems for cement and other materials was described by J. Muller. Upon proving its worth in the production of powdered coal, this method of conveying seems particularly adapted for handling cement and other powdered materials.

In conclusion Dipl. Ing. Bruckmann discussed transportation methods of the cement industry. Cables, overhead railways, elevators, cranes, bucket elevators with loading devices and automatic discharge, belts, etc., were shown in the course of the presentation.

All papers were received with great interest and it may be expected that the information they contained will yield to further activity in the direction of perfection in the German cement industry.

Government Statistics of Magnesite Supply in United States

THE production of crude magnesite in the United States in 1927 was 121,490 short tons, valued at $1,090,550, according to statistics compiled by J. M. Hill, of the United States Bureau of Mines, Department of Commerce. Three operators working 3 mines, one each in Santa Clara, Stanislaus, and Tulare counties, in California produced and sold 43,750 tons of crude magnesite, valued at $507,500. All of the output in Washington was from the mines of the Northwest Magnesite Co., which produced dead-burned magnesite at Chewelah. Two of its 6 furnaces were operated only part of the year.

Magnesite supply in the United States, 1922-1927, *expressed as crude magnesite, in short tons*

Year	Domestic	Imported	Total*
1922	55,790	217,861	273,651
1923	147,250	151,092	298,342
1924	120,100	148,700	268,800
1925	120,660	142,283	262,943
1926	133,500	196,318	329,818
1927	121,490	149,126	270,616

*Prior to 1924 a factor of 2 tons of crude to 1 ton of calcined was used in expressing imports as crude magnesite. Since 1924 the factors used are 2 to 1 for imports from Italy and 2½ to 1 for other imports.

Sales of magnesite of domestic origin in 1927 were 1,800 tons crude, 13,890 tons of caustic calcined (a decrease of 25 per cent as compared with 1926), and 40,210 tons of dead-burned (a decrease of 5 per cent as compared with 1926), having a total value of $1,460,240.

Imports of magnesite in 1927, according to the Bureau of Foreign and Domestic Commerce, were 891 short tons crude, valued at $9,790, of which 88 per cent came from Greece; 9,463 tons of caustic calcined, valued at $229,592, of which 60 per cent came from India and 33 per cent from the Netherlands; and 49,873 tons of dead-burned, valued at $727,881, of which 75 per cent was from Austria and Czechoslovakia. Corresponding figures for 1926 are 608 tons of crude, valued at $6,555; 14,830 tons of caustic calcined, valued at $330,131; and 77,108 tons of dead-burned, valued at $1,128,823.

Prices

Quotations* on crude magnesite during 1927 were $14 a ton. California Grade A, caustic calcined, ground 80 per cent through 200-mesh, was quoted at $40 a ton throughout the year and Grade B at $38 a ton. Dead-burned was quoted at $33 a ton, f. o. b. California mines, until the first of November, when the price was reduced to $30 and $32 a ton. Quotations, f. o. b. eastern seaboard, were $40 a ton throughout the year.

Domestic producers reported sales of crude magnesite at from $7.50 to $13 a ton, f. o. b. shipping point of mine, and the average price for all magnesite sold crude was $9.52 a ton. Producers of caustic calcined magnesite in the United States reported sales at from $30 to $34 a ton, the average price for the total sales of domestic being $32.60 a ton. Domestic dead-burned magnesite was sold at from $24 to $29 a ton, the average price for the entire output being $24.63 a ton, f. o. b. shipping point.

**Engineering and Mining Journal*, vols. 123 and 124, 1927.

DOMESTIC SUPPLY OF MAGNESITE IN VARIOUS FORMS IN 1927

Class	—Sales (domestic—		——Imports——		——Total——	
	Short tons	Value, f.o.b. mine	Short tons	Declared value	Short tons	Value
Crude	1,800	$17,130	891	$ 9,790	2,691	$ 26,920
Caustic	13,890	452,810	9,463	229,592	23,353	682,402
Dead-burned	40,210	990,300	49,873	727,881	90,083	1,718,181

Producers reported stocks of 6,150 tons of crude magnesite at plants on December 31, 1927.

By proclamation, under the Tariff Act of 1922, the president of the United States on November 10, 1927, increased the rate of import duty on magnesite as follows: Crude magnesite from 5/16 to 15/32 cents per pound (from 6.25 to $9.375 a short ton); caustic calcined magnesite from 5/8 to 15/16 cents a pound ($12.50 to $18.75 a short ton).

Is It Practical to Handle Loose Cement in Bulk?

Of all the things to which the success of American business has been attributed the most logical is, perhaps, the American credo of refusing to admit that "it can't be done."

An instance particularly fitting to this situation is the attempt made by the Peerless Portland Cement Company to handle loose cement in bulk.

Skeptics, ever present even in modern America, decried the use of any other method than handling in bags.

"If cement is exposed to air," they said, "it has a tendency to slack. It must be handled in small unit quantities put up in sacks."

"We propose to handle it in bulk," said the Progressives.

To which the Skeptics replied, "If you try to dump cement from a truck body, you'll need an eighty degree elevation and a slice bar. Cement doesn't flow like water, you know, and after even a short haul over city streets, the jostling and bouncing of a truck would so pack the cement that you'd find it almost as solid as if it were 'set' when you try to unload."

"That's what you say," countered the Progressives, in the form of the Peerless Portland Cement Company. "Nevertheless we're going to try it."

The Skeptics laughed. The Progressives experimented—and succeeded.

They had designed and built a special body to be mounted on a 5-ton 120-inch wheelbase Autocar truck chassis. The body is absolutely waterproof and is as air-tight as it is possible to make it. It is loaded through the two manholes in the top, protected by water-tight screw covers and is emptied through a waterproof canvas chute at the back.

And does the body need an eighty-degree elevation and a slice bar? It does not! In fact it was a surprise to all to learn that after a particularly rough ride over uneven roads the cement flowed freely at from 20 to 25 degrees elevation! And that without the use of a slice bar or other loosening device.

That this bulk-hauling of loose cement has been proven possible and practical is more than a novel experiment. It embodies an idea which, if put into general practice, should tend to lower the cost of wholesale cement in bulk quantities, for it will do away with many costly elements formerly attendant upon the delivery of this growing public utility.

Yes, American business can thank the slogan "It Can Be Done" for many of our modern methods, among them this modern way of handling loose cement in bulk.

Foreign Cement in Egypt

Jugoslavian, Belgian, German, British and French cement is reported to be finding a growing market in Egypt, particularly in Cairo. There is apparently a dearth of lumber and a plentiful supply of concrete-making materials.

An Electrical Method for Measuring Setting Time of Portland Cement

The Change in Electrical Resistance Which Occurs During the Setting and Hardening of Portland Cement, Has Been Measured for the Purpose of Determining the Setting Time—The Effect of Temperature on the Rate of Setting of Portland Cement Has Also Been Studied—This Method is Considered More Accurate Than the Mechanical and Thermal Methods Commonly Used

By YOSOMATSU SHIMIZU[1]

WHEN the setting time of portland cement is measured by a mechanical method, Vicat's needle is commonly used, but there are some disadvantages owing to the fact that setting and hardening of the cement are chemical processes. Gary, however, observed that at the moment when the final set occurs the temperature reaches a maximum,[2] and defining this moment as the final set, he tried to measure the setting time thermally.[3] Professor S. Uchida also determined the moment corresponding to the maximum temperature with a thermo-couple, by the differential method, and measured the setting time;[4] but this thermal method is not regular, that is, the time of setting is greatly affected by the quantity of the material used for the specimen. In an experiment dealing with portland cement, the writer hit upon the following method to determine the setting time by the change in electrical resistance.

It was observed by the writer that when the electrical conductivity was measured during the setting and hardening, the specimen being kept at a constant temperature, the electrical resistance suddenly changed at the moment corresponding to the final set, that is, to the maximum temperature described above (Fig. 1). In Fig. 1, the break point *P* in the curve *B P C* is the point corresponding to the moment of the final set, i. e., to the maximum temperature, and the portion of curve *P C* corresponds to the hardening, and, if the time in days is taken as the abscissa, the curve will become hyperbolic, as shown in Fig. 2. Therefore, the present writer defined the time required to reach *P* as the period of final set, and experiments were carried out with this method, to study the effect of temperature on the rate of setting, and also to test the accuracy of the method.

Fig. 1.

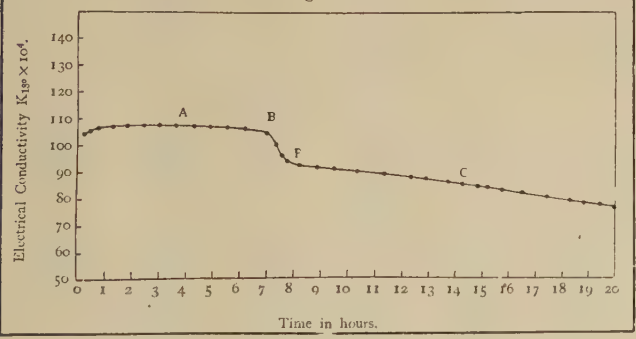
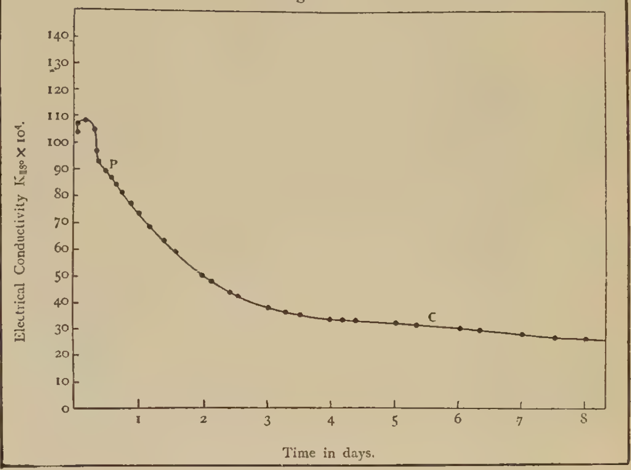


Fig. 2.



Measuring Apparatus and Method of Measurement

A hardened portland cement is electrically a semi-conductor. Owing to the phenomenon of polarization, we cannot carry out measurements with a direct current and a galvanometer, and it is necessary to measure with an alternating current and a telephone-receiver or an electro-dynamometer. Hence, for this purpose, Kohlrausch's alternating-current bridge[5] was used. Also, as the processes which occur in setting and hardening are accelerated and electrical resistance is varied by temperature, it is absolutely necessary, for the determination of the setting time, to keep the specimen at a constant temperature, and a thermostat, therefore, was used. In Fig. 3, the experimental apparatus for this measurement is sketched. A glass tube *A* contains two platinum electrodes, and the details have been shown in Fig. 4. The dimensions of the tube are 2 cm. in diameter and 25 cm. in length, and two side tubes *U* and *T* are attached to it. After an experiment, hydrochloric acid was poured into the tube *T* to dissolve the specimen, and the dissolved specimen was then allowed to flow out through the other tube *U*. Also in order to avoid the loss of the gauging water, the upper ends of the glass tube were each closed with a cork. In Fig. 3, *B* is a thermostat and *F* a small motor for a stirrer *I*. *G* is a temperature regulator, *H* a thermometer, *K* a heater made of nichrome wire, and *L* a current relay, which in co-operation with *G* makes or cuts the current passing through *K* automatically, whenever the temperature is too high or too low to keep the specimen at a constant temperature.

---

[1] The 180th report from the Research Institute for Iron, Steel and Other Metals.

[2] W. and D. Asch consider that it is due to the separation and hydration of calcium oxide from the alumino-silicate molecule. W. Asch and D. Asch, "The Silicates in Chemistry and Commerce," (1913), 189.

[3] Gary and Stradling, *Conc. and Const. Eng.*, 1, (1901-1907), 356, 432.

[4] S. Uchida, Sci. Rep. of the Sendai Higher Technical School, 1, (1923), 17.

[5] Kohlrausch, *Lehrbuch der Praktischen Physik*, 1914, 479.

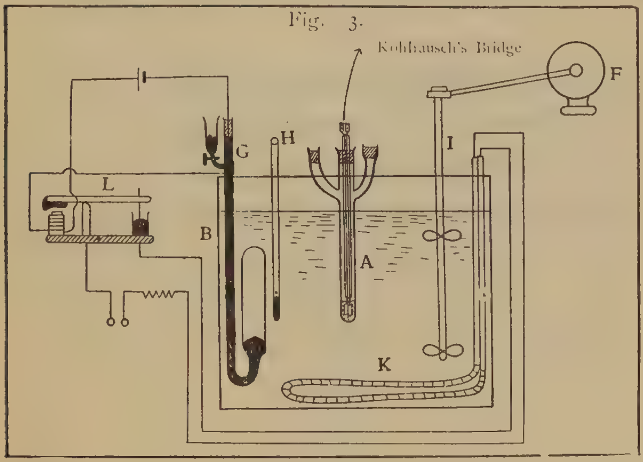


Fig. 3.

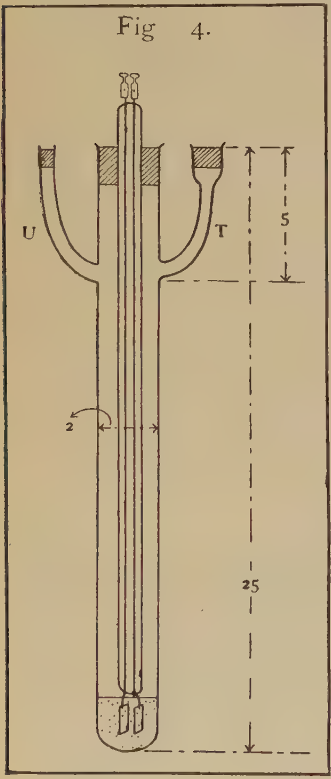


Fig 4.

The portland cement used in this experiment was manufactured by the Asano Cement Co.

Before the experiment the cement water and all the other tools used for gauging were warmed for about 24 hours, in an air-thermostat at a constant temperature. The quantity of the cement used in each experiment was 12 gr. and this was gauged for about 3 minutes with a quantity of water 27 per cent in weight. The specimen gauged with water was put into the bottom of the glass tube A, and two platinum electrodes were inserted vertically into, thus gauged. These were set in the thermostat *B*, and the platinum electrodes were connected with a Kohlrausch bridge; the measurement was then begun and the readings were recorded every 5 or 10 minutes.

Results of the Experiments

The results of the experiments are shown in Fig. 5 and given in tables 1-6, the arm ratios in the second columns being proportional to the electrical resistance. In Fig. 5, specific electrical conductivity $K \times 10^4$ is taken as the ordinate and the time from the beginning of the gauging as the abscissa. As seen from the figure, the rate of the setting and hardening is greatly influenced by the temperature, and hence the time of the final set is remarkably shortened with a rise of temperature. At various temperatures, the changes in electrical resistance at its setting and hardening are all similar.

TABLE 1. 18 DEG. C.

Time, Minutes	Reading, Arm Ratio	Time, Minutes	Reading, Arm Ratio	Time, Minutes	Reading, Arm Ratio	Time, Minutes	Reading, Arm Ratio
10	12.5	335	12.3	685	14.6	1075	16.1
15	12.5	375	12.3	715	14.7	1125	16.4
20	12.4	405	12.4	745	14.7	1155	16.5
35	12.2	435	13.5	775	14.8	1205	16.5
55	12.2	455	13.7	805	14.9	1235	16.8
75	12.2	475	14.0	825	15.0		
95	12.2	495	14.1	855	15.1		
135	12.2	515	14.2	885	15.2		
175	12.2	545	14.4	925	15.4		
205	12.3	565	14.4	945	15.5		
235	12.3	595	14.5	975	15.8		
265	12.3	625	14.5	1015	16.0		
295	12.3	655	14.6	1045	16.0		

TABLE 2. 25 DEG. C.

Time, Minutes	Reading, Arm Ratio	Time, Minutes	Reading, Arm Ratio	Time, Minutes	Reading, Arm Ratio	Time, Minutes	Reading, Arm Ratio
10	11.0	270	10.5	560	12.4	940	13.2
30	10.3	290	10.6	580	12.5	970	13.3
50	10.3	310	10.6	600	12.5	1000	13.4
70	10.3	330	11.2	640	12.6	1030	13.5
90	10.3	340	11.5	680	12.7	1060	13.6
110	10.4	360	11.5	700	12.7	1090	13.8
130	10.4	380	11.7	730	12.7	1120	13.8
150	10.4	400	11.8	760	12.8	1150	13.9
170	10.4	420	11.8	790	12.8	1180	14.0
190	10.4	440	11.9	820	12.9		
210	10.5	460	12.0	850	13.0		
230	10.5	480	12.0	880	13.0		
250	10.5	540	12.3	910	13.1		

TABLE 3. 30 DEG. C.

Time, Minutes	Reading, Arm Ratio	Time, Minutes	Reading, Arm Ratio	Time, Minutes	Reading, Arm Ratio
10	10.8	225	10.8	475	12.4
25	10.6	245	10.8	505	12.5
45	10.5	265	11.2	535	12.6
65	10.5	285	11.5	595	12.8
85	10.5	295	11.6	655	13.0
105	10.5	305	11.8		
125	10.6	325	11.8		
145	10.6	345	11.9		
165	10.6	365	12.0		
185	10.7	385	12.1		
205	10.7	445	12.3		

TABLE 4. 30 DEG. C.

Time, Minutes	Reading, Arm Ratio	Time, Minutes	Reading, Arm Ratio	Time, Minutes	Reading, Arm Ratio
10	10.2	160	9.8	270	10.8
20	10.2	180	9.8	290	10.9
30	9.8	200	9.9	350	11.2
60	9.7	220	10.2	380	11.3
80	9.7	230	10.5	410	11.4
100	9.7	240	10.6	440	11.5
120	9.8	250	10.7		
140	9.8	260	10.8		

TABLE 5. 40 DEG. C.

Time, Minutes	Reading, Arm Ratio	Time, Minutes	Reading, Arm Ratio	Time, Minutes	Reading, Arm Ratio
10	9.4	165	8.9	295	10.1
20	9.0	185	8.9	315	10.2
30	8.9	205	9.0	335	10.3
45	8.7	215	9.2	355	10.3
65	8.7	225	9.4	385	10.4
85	8.7	235	9.7	465	10.7
105	8.8	245	9.9	495	10.8
125	8.8	255	9.9		
145	8.8	275	10.0		

TABLE 6. 50 DEG. C.

Time, Minutes	Reading, Arm Ratio	Time, Minutes	Reading, Arm Ratio	Time, Minutes	Reading, Arm Ratio	Time, Minutes	Reading, Arm Ratio
10	8.6	100	8.3	220	8.6	260	9.1
15	8.4	120	8.3	225	8.7	280	9.2
20	8.3	140	8.4	230	8.8	300	9.2
30	8.2	160	8.4	235	8.9	330	9.3
40	8.2	180	8.5	240	9.0	360	9.4
60	8.2	200	8.5	245	9.1	390	9.5
80	8.3	210	8.5	250	9.1	420	9.6

---

[6] S. Uchida, Sci. Rep. of the Sendai Higher Technical School, 1, (1923), 41.

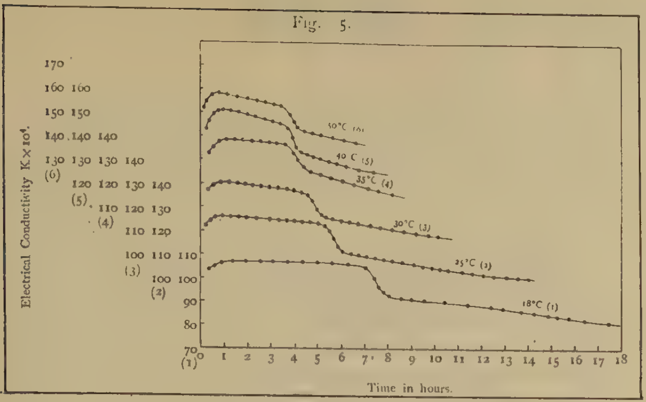


Fig. 5.

The relation between the setting time determined by the electrical resistance and temperature is graphically shown in Fig. 6. This curve is nearly parallel to that obtained by Professor S. Uchida with Vicat's needle.[6]

This method for determining the setting time by electrical resistance is better adapted and more accurate than the mechanical and thermal methods commonly used. This method is also applicable not only to neat cement, but also to mortar and concrete.

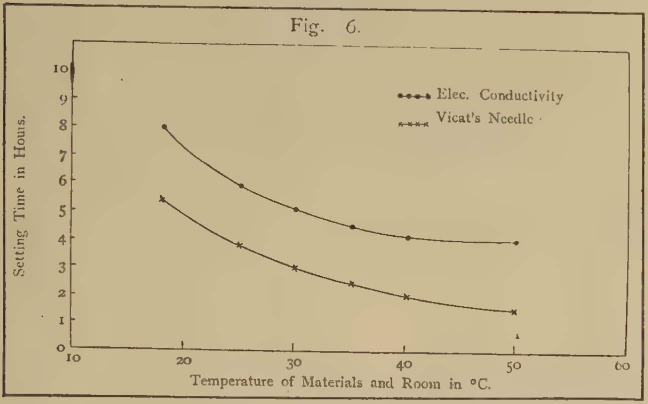


Fig. 6.

The writer is now studying the setting time of blast-furnace cement, alumina cement, mortar, and concrete. It is expected that in the case of blast-furnace cement, two breaks of conductivity-time curve, which is undetectable by the mechanical or thermal methods, will be detected by this method, the one corresponding to the setting time of portland cement and the other to that of the blast-furnace slag, as this material is a mixture of slag and portland cement.

In conclusion the writer wishes to express his cordial thanks to Professor K. Honda and also Assistant Professor S. Uchida, under whose kind guidance the present experiment has been carried out.

New Books

Electric Apparatus for Use with the Cottrell Precipitation Process. Published by General Electric Company.

The Cottrell method of precipitating dust is quite thoroughly defined in this 16-page booklet. Details of its general construction, motors, regulators and rheostats, switchboards, rectifying equipment, capacity, and so forth are contained in this publication.

The last pages bear a brief bibliography of articles on the theory of electrical precipitation and application to particular industries.

Lime Convention to Discuss Critical Conditions

The 1928 convention of the National Lime Association is to be held at the Belmont Hotel in New York City on May 23-24, as announced by the convention committee after careful consideration of many hotels and suggested dates. The most emphatic note in the announcement is that this is to be a convention of the industry, rather than of the association, thus recognizing the sound principle that the industry must be given a time and place to discuss the critical conditions which lost over three million dollars last year, with a decrease of over two hundred thousand tons in production.

To carry out this purpose there is to be no program for the convention, and no cut-and-dried plan to be offered for acceptance. Members and others are submitting questions bearing directly upon conditions which prevail in various sections of the country, and these questions will serve as the basis of a round table discussion. It is hoped that this discussion will form some constructive plans to put the industry upon a sound basis.

In order to remove all suggestion of formality and predetermined conclusions, the chairmanship of the convention has been given to one chosen for his appreciation of present conditions and his freedom from any part in the controversies which prevail. This is at the request of J. F. Pollock, chairman of the board, and expresses the desire of the board for a strictly open meeting. The chairman will be S. W. Stauffer, of the J. E. Baker Company, at York, Pennsylvania. Everyone present will have an opportunity to talk, as long as his remarks bear upon the real problems of the industry.

In order that there shall be no restraint whatever, and that the discussion may be strictly free, barring improper matters, the convention will not be reported for the publishing of proceedings.

One, probably two, outstanding men will address the convention, and arrangements are under way with two men whose names will be sufficient urge for every lime manufacturer to attend.

The convention committee is headed by S. W. Stauffer, assisted by A. B. Mack, assistant to the president, Kelley Island Lime and Transport Company, Cleveland, and G. B. Arthur, general manager of the National Lime Association, Washington, D. C.

1927 Japanese Production Shows 11 Per Cent Gain Over 1926

Cement production in Japan for 1927 totaled 21,052,000 barrels, a gain of 2,443,000 barrels over 1926, according to a report of the Japan Cement Association. Sales amount for the year was 20,751,000 barrels, also a gain of 1,488,000 barrels. Balance of contracts at the end of 1927 was 6,827,000 barrels, an advance of 652,000 barrels over the end of 1926. The month-end stocks were 1,223,000 barrels, a gain of 242,000 barrels.

Depression pervaded the cement business in Japan for last year, it is reported. Except for the Onoda Cement, whose dividend remained unchanged for the latter half, all leading companies either reduced their dividends or declared no dividend.

The average ratio of profit for 16 cement companies belonging to the association for the last term was 10.6 per cent against 17 per cent each for the preceding two terms.

Capacity during 1926 rose 27 per cent and during 1927 rose 8.3 per cent. Demand during 1926 and 1927 rose respectively 28 and 10 per cent.

Cement Statistics for March

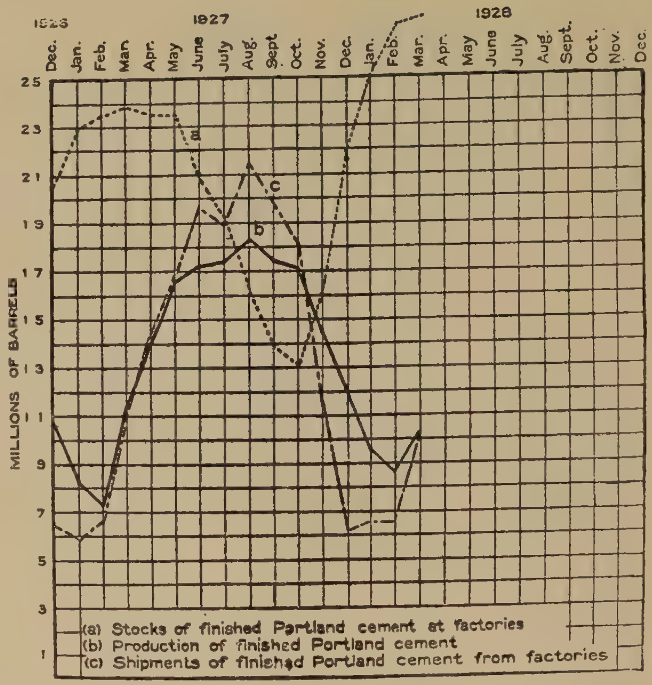
THE portland cement industry in March, 1928, produced 10,223,000 barrels, shipped 10,135,000 barrels from the mills, and had in stock at the end of the month 27,436,000 barrels, according to the United States Bureau of Mines, Department of Commerce. The production of portland cement in March, 1928, showed a decrease of 10.7 per cent and shipments a decrease of 8.7 per cent, as compared with March, 1927. Portland cement stocks at the mills were 14.7 per cent higher than a year ago.

The statistics here presented are compiled from reports for March from all manufacturing plants except two, for which estimates have been included in lieu of actual returns.

In the following statement of relation of production to capacity the total output of finished cement is compared with the estimated capacity of 155 plants at the close of March, 1928, and of 141 plants at the close of March, 1927.

Relation of Production to Capacity

	March 1928	March 1927	Feb. 1928	Jan. 1928	Dec. 1927
	Per cent	Per cent	Per cent	Per cent	Per cent
The month	51.7	61.9	47.5	49.4	60.7
The 12 months ended	74.6	76.0	75.1	74.5	76.2



Production, Shipments and Stocks of Finished Portland Cement, by Months and by Districts, 1927 and 1928, and Stocks in February, 1928

Month	Production 1927	Production 1928	Shipments 1927	Shipments 1928	Stocks at end of month 1927	Stocks at end of month 1928
January	8,258,000	*9,771,000	5,968,000	*6,546,000	22,914,000	*25,116,000
February	7,377,000	*8,797,000	6,731,000	*6,563,000	23,563,000	*27,349,000
March	11,450,000	10,223,000	11,100,000	10,135,000	23,922,000	27,436,000
April	14,048,000		14,350,000		23,654,000	
May	16,701,000		16,865,000		23,503,000	
June	17,224,000		19,761,000		20,972,000	
July	17,408,000		18,984,000		19,397,000	
August	18,315,000		21,411,000		16,292,000	
September	17,505,000		19,828,000		13,996,000	
October	17,174,000		18,105,000		13,141,000	
November	14,449,000		11,619,000		16,022,000	
December	11,999,000		6,200,000		*21,950,000	
	171,908,000		170,922,000			

---

*Revised.

District	Production—March 1927	Production—March 1928	Shipments—March 1927	Shipments—March 1928	Stocks at end of March 1927	Stocks at end of March 1928	Stocks at end of Feb., 1928*
Eastern Pennsylvania, New Jersey, Md.	2,997,000	2,512,000	3,081,000	2,396,000	5,677,000	6,682,000	6,566,000
New York	597,000	587,000	481,000	499,000	1,568,000	1,865,000	1,778,000
Ohio, Western Penn., and West Virginia	1,262,000	851,000	932,000	833,000	3,272,000	3,411,000	3,393,000
Michigan	551,000	560,000	596,000	505,000	1,975,000	2,260,000	2,205,000
Wisconsin, Illinois, Indiana, and Kentucky	1,308,000	933,000	1,198,000	1,004,000	3,348,000	3,661,000	3,732,000
Virginia, Tenn., Ala., Ga., Fla., and La.	1,201,000	1,268,000	1,220,000	1,298,000	1,178,000	1,935,000	1,966,000
Eastern Missouri, Iowa, Minn., and So. Dak.	714,000	687,000	729,000	730,000	3,226,000	3,912,000	3,955,000
Western Missouri, Nebraska, Kansas, Okla.	753,000	645,000	725,000	829,000	1,584,000	1,463,000	1,647,000
Texas	465,000	552,000	492,000	563,000	448,000	449,000	460,000
Colorado, Montana, and Utah	118,000	160,000	138,000	174,000	470,000	482,000	496,000
California	1,179,000	1,171,000	1,195,000	1,082,000	692,000	853,000	764,000
Oregon and Washington	305,000	297,000	313,000	222,000	484,000	463,000	387,000
	11,450,000	10,223,000	11,100,000	10,135,000	23,922,000	27,436,000	27,349,000

---

*Revised.

EDITORIAL

The June No-Accident Campaign

AGAIN, at sunrise on June 1st, the no-accident flag will fly under Old Glory on the flag staffs of cement plants throughout the length and breadth of the land and another June no-accident campaign will be under way. That flag will fly every day of the month over every plant that goes through June without an accident.

For several years, with the exception of 1926, special efforts were made during June to reduce or eliminate accidents in cement plants. The results showed how successful these campaigns were. In June, 1927, there were only 56 accidents—less than 30 per cent of the normal number for the month. In 1928, the industry expects a perfect record.

It can come as close to reaching this mark as the men in the plants want to. The problem is to get the whole-hearted co-operation of every man in the industry from the president down. On May 1st mass meetings will be held in all the plants and throughout the month the committees will be at work preparing for a perfect record.

Two fundamental appeals are being used—competition and co-operation. The element of competition hinges on the awards of safety trophies and that of co-operation on a plan which makes every president responsible for his company, every superintendent responsible for his plant, every foreman responsible for his department and every man responsible for his and his fellow workers' personal safety.

Here is a job that deserves the whole-hearted co-operation of every man in the industry. Aside from the savings accident prevention makes possible it is a work that is worth while from a purely humanitarian point of view.

Let's make June, 1928, a 100 per cent no-accident month!

* * *

H. A. Schaffer

ELSEWHERE in this issue will be found a notice to the effect that H. A. Schaffer, formerly manager of the Conservation Bureau of the Portland Cement Association, has left that organization. He has not left the industry, however, and will still have opportunity to visit his many friends and to give them the benefit of his wide experience.

Mr. Schaffer's work for the past nine years has been of great value to the cement industry. "Concrete" joins with the host of his friends in expressing its appreciation of his services to the industry.

* * *

"Chain Store" Cement Plants?

THE chain store idea, or some modification of it, has taken hold in many industries. It seems that such centralized control of policies and merchandising plans has been profitable. The trade demonstrates its approval of the chain store by patronizing it.

Are there indications that, in some measure at least, this chain store idea is gaining a hold in the cement industry? If you will turn to the Men and Mills pages in this issue, you will see a number of items referring to mergers or consolidations or purchases of cement plants. More and more individual plants are being taken over and operated by group organizations which also control the sales and merchandising policies of the product produced.

Other indications of the chain store idea are found in the establishment of storage silos for bulk cement in various cities from which the cement is delivered to the adjacent market. Are these auxiliary "plants" not local stores for the distribution and marketing of a product sent in bulk to the cement "store"?

Then, too, even a casual glance at the locations chosen for most of the new cement plants erected during the past year or two, or now under construction, bears out this idea of a cement store conveniently located with respect to its principal market. Truck deliveries of either bulk cement or cement in packages still further carry out the similarity.

Is it not probable that this development will continue? The industry faces a very real merchandising problem and all these developments are distinct helps in merchandising. Perhaps ultimately each city providing a fair market in itself will have a cement plant (or a cement store) conveniently located to supply its needs and depending on that city for its market. Whether this plant will be operated under individual management or as a "chain plant" or as a subsidiary under centralized control will, in the last analysis, depend on the quality of its product and the quality of its merchandising efforts.

MEN and MILLS

Notes from the Field

Penn-Dixie Buys Pyramid

Combined Annual Production Will Be 12,250,000 Barrels—Stockholders Fight Merging of North American and Penn-Dixie

The Pennsylvania-Dixie Cement Corporation, in an official statement, has announced the purchase of the Pyramid Portland Cement Company, Des Moines, Iowa. The acquisition of this company will materially extend the distribution of the products of the Penn-Dixie company and will contribute 1,250,000 barrels additional to the annual output, making a total of 12,250,000 barrels yearly.

The mill of the Pyramid Portland Cement Company is situated at Valley Junction, a few miles southwest of Des Moines. The plant will be run to full capacity immediately. Its central location enables shipments to all points in the state of Iowa and widely into the neighboring states at most advantageous freight rates and places the company in a preferred position to meet competitive prices within shipping radius. Recent surveys indicate an abundance of raw materials available on the property. Extensive improvements and enlargements will be made to equip the plant for increased production at reduced costs.

Current reports have coupled the names of the Pennsylvania-Dixie Cement Corporation and the North American Cement Corporation in a merger as the "General Cement Corporation." The plan for consolidation has been submitted to the stockholders.

Minority stockholders in the North American Cement Corporation have united and are preparing to fight the merger in the Delaware courts. the state in which the North American is incorporated.

Opposition to the merger is said to be based on the terms of the stock transfer. Under the merger plans preferred stock in the North American corporation will be exchanged at the ratio of one preferred, with a par value of $100, for two shares of new common, of no par value. Under present plans, North American stockholders, holding stock paying nothing in dividends, would exchange each share for a half share of the new common, having a market value and paying a dividend.

That the stock transfer is unfair to them is claimed by the owners of North American preferred.

H. A. Schaffer Leaves Portland Cement Association

The Portland Cement Association lost the head of its Conservation Bureau recently when H. A. Schaffer left the association to join the Bates Valve Bag Corporation as eastern sales manager.

Mr. Schaffer will undoubtedly fill his new position exceptionally well. He has been identified with the cement industry for over thirty years, in various capacities. He was once the chief chemist of the Vulcanite Portland Cement Company and later the chief chemist and manager of the Northampton Portland Cement Company. For four years, beginning in 1914, he was a member of the firm of Harrison & Schaffer, consulting engineers. In 1918 he was called to Washington to serve on the War Industries Board as assistant to the director of the building materials division.

Upon joining the Portland Cement Association shortly after the war, Mr. Schaffer instituted studies that resulted in improved labor efficiency and solved mechanical problems in member plants.

At a recent meeting with the Conservation Committee of the association, Mr. Schaffer was presented with a beautiful silver tray and coffee set, inscribed with a testimonial, as an expression of the committee's appreciation of his services.

The Bates offices in New York City and Nazareth, Pennsylvania, will be headquarters for Mr. Schaffer in his new capacity.

International Offers $18,000,000 in Debentures

New financing for the International Cement Corporation took place on April 12th with the offering of $18,000,000 in 20-year 5 per cent convertible debentures at 97 and interest, to yield about 5.25 per cent.

Proceeds from their sale and of 56,250 shares of common stock, which are being offered to shareholders, will be used to finance the purchase of two additional plants and to retire $9,549,800 cumulative preferred stock and for other corporate purposes.

Net 1927 income of $4,554,172 was equivalent to $6.90 a share on the common stock.

Warrior Stockholders Consider Merging Offers

As a result of proposals to merge from four organizations, a meeting of stockholders of the Warrior Cement Corporation was called for April 27th. What action was taken at the meeting has not yet been made known.

The Warrior company was formed in 1927, with a plant at Spocari, Alabama. At that time it took over the Gulf States Portland Cement Company. Production is said now to be 3,000 barrels a day.

Pacific Dividend

A regular quarterly dividend of $1.62½ on preferred stock was declared on March 31st by the Pacific Portland Cement Company, San Francisco, Calif.

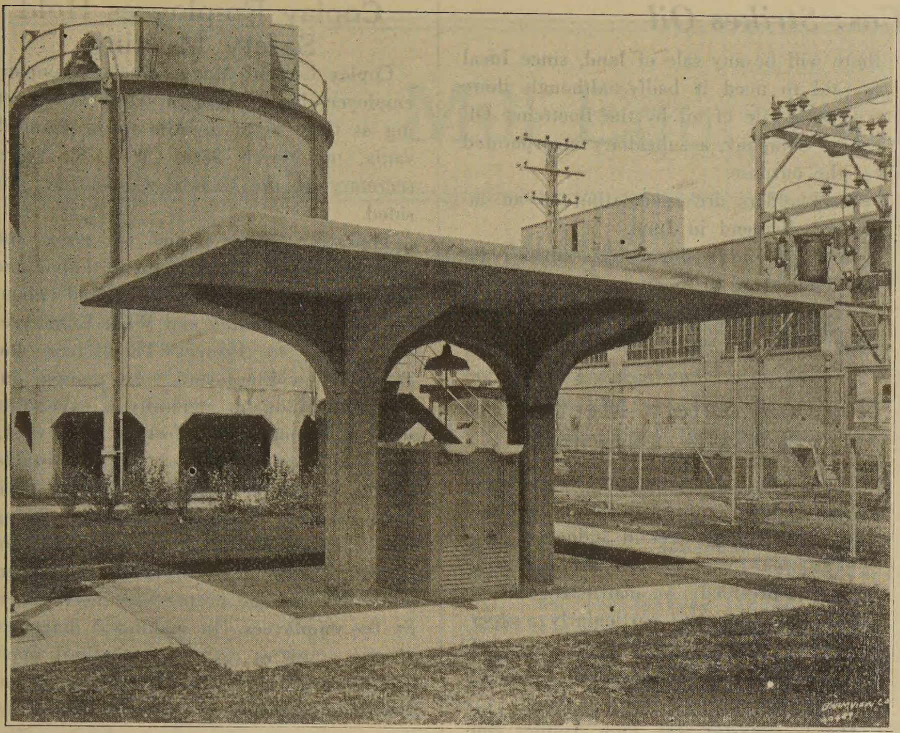
Peerless Reported Merged with Bessemer Steel

The Peerless Portland Cement Company of Union City, Michigan, has been merged with the Bessemer steel interests, according to local press reports.

Phoenix Plants To Be Bought by Alpha and International

A report from the Lehigh Valley was received to the effect that the plants of the Phoenix Portland Cement Company were to be sold. An attempt to verify this report revealed the fact that negotiations are under way for the purchase of the Birmingham plant of the Phoenix Portland Cement Corporation by the Alpha Portland Cement Company of Easton, Pennsylvania. Information has been released to the effect that the proposed purchase will be definitely decided upon early in May.

It is reported that the International Cement Corporation has purchased the Nazareth, Pennsylvania, plant of the Phoenix Portland Cement Company.



Amidst slurry tanks and power houses is found this shady spot in the South where workers may partake of H_2O. The Phoenix Portland Cement Company at Birmingham, in erecting its plant, was as thoughtful of the welfare of its labor as to provide this covered drinking fountain

Regional Safety Meeting Held in South

The regional safety meeting of the Portland Cement Association was held on Friday, April 6th, at Dallas, Texas.

A report on safety work in the industry during the last year was given by A. J. R. Curtis of Chicago, secretary of the association's committee on accident prevention. Also on the program for the morning session were J. W. Ganser and R. M. Moore of Dallas.

C. E. Ulrickson of Dallas presided at the luncheon, following which the afternoon session, over which O. V. Bartholomew of Dallas took charge, met to hear H. O. Rinehold of San Antonio, J. E. Bonnell of Dallas, E. M. Cowpland and C. J. Rutland of Dallas.

Round-table discussion of current safety problems were heard from C. J. Lofstedt, Houston; A. A. Chaney, Fort Worth; R. O. Bartholomew, Houston; O. V. Bartholomew, H. E. Nichols and Mr. Bonnell.

Homer R. Mitchell spoke at the dinner, at which E. S. Morgan was the toastmaster.

Richard City Plant Kilns Placed in Operation

Penn-Dixie's two new kilns at Plant No. 3 at the Richard City, Tenn., plant were placed in operation on March 30. They are 11 ft. 3 in. to 10 ft. in diameter and 343 ft. long.

Direct Loading in Bulk Equipment at Gold Hill Plant

The Gold Hill, Oregon, plant of the Beavor Portland Cement Company has installed equipment enabling it to load cement direct from the mills into railroad cars in bulk.

The arrangement was necessary in order to fill the company's contract for the city of Portland sea wall for 100,000 barrels of cement, which could not be sacked and shipped fast enough to meet the required daily shipments. These shipments are made in 300 barrels or 60 tons per car.

Monolith Profits Show Slight Decrease

Profits of the Monolith Portland Cement Company of Los Angeles before providing for reserves, for depreciation and for federal taxes amounted to $597,984 in 1927, according to a report issued by the company March 27th. This compares with $617,968 in 1926, a decrease of $19,984, or 3 per cent.

Net income after allowing for preferred stock dividends amounted to 32 per cent on the common stock or approximately 33 cents per barrel. Average yearly profits over a five-year period, after providing for preferred dividends, amounted to $474,300, which is equivalent to 32 per cent on the common stock or 44 cents per barrel.

Shipments of cement during 1927 showed an increase of 89,529 barrels, gaining from 1,356,264 to 1,445,793 barrels in 1927. Profit per barrel declined from 45 cents in 1926 to 41 cents in 1927.

Total assets of the company amounted to $6,300,119 of which $151,524 was cash on hand and in banks. Accounts receivable aggregated $420,918 and inventories totaled $203,366. Investments amounted to $58,080 and fixed assets aggregated $5,425,956.

Monolith Portland Cement Company was incorporated under the laws of Nevada in 1920 and manufactures cement in excess of 400 barrels a day at the plant located at Monolith, Kern County, Calif.

To Repeat June Safety Drive in Plants

Safety pledges are again being received by the Portland Cement Association in the drive to be held again this June. Banners will be distributed, to be flown, as last year, in June while the plant is accident-free.

Aetna Disputes City's Right to Rescind Contract

Brings Suit in Court to Establish Validity of Contract

The Aetna Portland Cement Company is the plaintiff in a suit brought against the city of Flint, Michigan, alleging a breaking of contract. The company claims that the city, after asking for sealed proposals for furnishing the city with 75,000 barrels of cement accepted the bid of the Aetna company, which was the lowest of six received. The city council later rescinded its previous action and awarded the contract to a group of Flint building material dealers who gave a second proposal at a lower bid.

A temporary injunction was granted in the circuit court in March prohibiting the opening of new bids by the council or the awarding of contracts for cement. The court refused to dismiss the injunction, holding that a valid contract had been formed. The city then argued that the entire business of awarding the contract was considered a farce by the administration under which neither the city nor the other contracting party could be held by the other. The bids were asked for merely to secure an estimate of what the cement would cost, it was said.

The council, restrained from opening any further bids on cement, is awaiting the outcome of the Aetna company's suit in federal court for alleged breach of contract before taking any further action.

Ideal Drills for Gas: Strikes Oil

An oil well that flowed 168 barrels of 28.6 gravity oil during the first 24-hour test was struck unknowingly by the Ideal Portland Cement Company near its plant at Ada, Oklahoma, recently. Gas for the plant was being drilled for. As soon as it was known that oil had been struck, the order was given to drill more wells.

Large oil companies are said to have offered $1,000 an acre for the 1,200 acres of ground. It is not likely, however, that there will be any sale of land, since Ideal is said to need it badly, although there will be a sale of oil by the Boettcher Oil & Gas Company, a subsidiary incorporated for the purpose.

Stockholders are speculating on an increased dividend in June.

In the meantime, Ideal declared its regular dividend of $1.75 on preferred and $1 on common stock, payable April 1st to stockholders of record March 15th.

Plans for Monolith Texas Plant Forming

Plans for the Monolith Portland Cement Company plant to be located on the government channel, inside jetties, on Harbor Island, at Port Aransas, Texas, are in the formative stage. Announcement has been made that the Monolith company has entered into an agreement with the state of Texas to start construction of the plant in a short time, concentrating on the production of a plastic waterproof product.

The contract provides also for the purchase on a royalty basis of oyster shells found along the Gulf coast. These will be transported to the plant by barge.

An export trade of $4,000,000 annually will be sought.

The company will be organized independently of the Monolith Portland and the Monolith Midwest Portland and will be headed by Coy Burnett, president of the last two mentioned. Judge Frederick C. Robertson is associated with Mr. Burnett in the work.

Seattle Plant Construction Begun in April

Work got under way on the Seattle plant of the Pacific Coast Cement Company on March 24th, following ceremonies on the day previous when a formal survey of the ground was made.

Construction of the foundation pilings began in April. Production is expected to begin in November. Two steel shipping board freighters have been purchased in the East and will be sent through the Panama Canal to the Pacific Coast, to be used in the transportation of limerock from Alaska.

Sales will be directed by Vice-President Wylie Hemphill, assisted by Sales Manager Darwin Meisnest.

Atlas Plant Reopens

The Hudson, New York, plant of the Atlas Portland Cement Company resumed work on Monday, March 12th, after a two-month shutdown. During the interval, the plant was given a general overhauling.

Regional Safety Meeting at LaSalle, Illinois

A regional safety meeting was held at LaSalle, Illinois, on April 19th. Chairman John J. Kelly, manager of industrial relations for Marquette Cement Manufacturing Company, presided. An instructive talk on self-control, addressed particularly to superintendents, was given by Professor L. J. McCormick, of the LaSalle-Peru Township high school.

The toastmaster was John Young, general superintendent of the Lehigh plant at Oglesby.

New Alabama Rate

The Alabama Public Service Commission has issued an order declaring the intrastate rate for cement in carload lots to lack uniformity and substituting a revised scale of rates.

The new scale is to be strictly applied from all shipping points except that for distances in excess of 100 miles, the distance and scale from Birmingham shall be used in computing rates from Phoenixville, North Birmingham and Boyles.

Monolith Making Progress at Wyoming Plant

The new plant being erected by the Monolith Midwest Portland Cement Company at Laramie, Wyoming, was about three-fourths complete on the first of April, and indications point to operation this summer. The kiln will be 343 feet over all.

Alpha Michigan Plant Resumes Operation

Spring repair work began in the middle of March at the Alpha Portland Cement Company plant at Bellevue, Michigan. The shutdown was of three months' duration. Production was resumed early in April.

Ford Cement Production

A report issued by the Ford Motor Company of production in its various auxiliary activities in 1927, places the cement figure at 687,149 barrels.

Coplay Employees Hold Safety Meeting

Coplay Cement Manufacturing Company employees held a general safety first meeting at their plant at Allentown, Pennsylvania, on March 28th. Wm. F. Nagle, secretary of the Central Committee, presided.

Thos. J. Quigley, chief of mines and quarries section, Department of Labor and Industry of Pennsylvania, talked about "Accident Prevention and What Employees Are Doing to Protect Themselves and Their Fellow Employees." He pointed out that while industry generally is expending sums of money in an effort to make working conditions safer and more favorable for its employees, statistics covering accidents reported throughout the state during the last year show that a very large proportion of these accidents might have been prevented had the proper care been taken by the employees. In making a diagnosis of the statistics covering non-fatal accidents during the last year, it revealed the fact that the principal causes of such accidents were not on account of unguarded machinery, but causes very frequently under control of the employee, such as handling material, falling objects, falls of persons, hand tools, etc. Mr. Quigley in detail pointed out that falling objects was the highest cause of fatal accidents in industry during the year 1927 with cars and engines the second highest cause, non-fatal accidents reported throughout the state of Pennsylvania during 1927 showing a substantial decrease.

The meeting was closed with a few remarks by Harold Johnson, inspector of the Department of Labor and Industry.

Petoskey Makes Record Shipments in Day

A record in cement shipments by rail was made by the Petoskey Portland Company on April 7th, when two trainloads were loaded and shipped. This was the largest number of railroad cars sent out in a single day.

The record is due, it is said, to some extent to a sales contest which was held from March 28th to April 7th.

Cement Man Joins Advertising Firm

Warren J. Chandler, former advertising manager of the Lehigh Portland Cement Company, has left Lehigh to join the Thomsen-Ellis Company of Baltimore, as its sales manager.

Atlas Plant Reopens

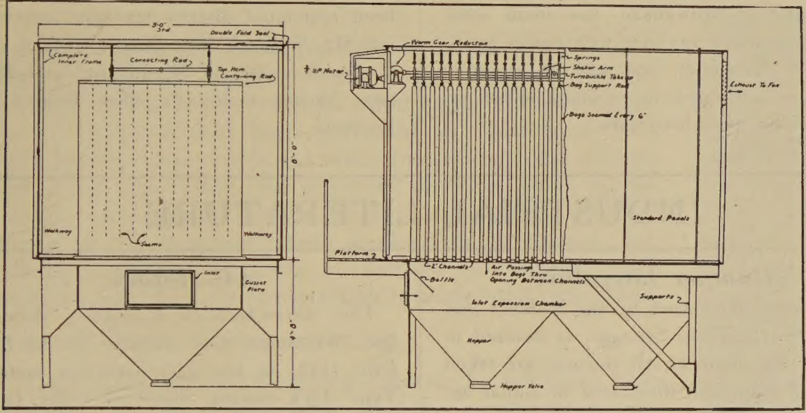
Mill No. 2 of the Atlas Portland Cement Company, at Northampton, Pennsylvania, resumed operation on April 17th. Its recent three months' idleness was the longest shutdown in a number of years.

Mill Equipment

New Haven Flat Bag Dust Arrester

Ample cloth area in a small space and a shaking mechanism keeping friction loss through the cloth at a minimum are two high spots of the New Haven flat bag dust arrester. The arrester is a new development of the New Haven Sand Blast Company, New Haven, Connecticut; and Cleveland, Ohio.

The arrester consists of a rectangular, air-tight baghouse, erected over an inlet expansion chamber with hopper bottoms. A steel partition having a series of steel channels spaced to allow passage of air from expansion chamber to baghouse separates the baghouse from the expansion chamber. The spaces are covered with a series of bags which filter the air as it is drawn by suction from the expansion chamber to the baghouse proper. The inlet pipe line may enter the expansion chamber at any side and the exhaust connection from the baghouse to the fan may be made at the upper end of the inside panel.



Bags are suspended on individual springs and connected to the motor shaker. Sufficient walkway is provided around the bag section itself and the baghouse platform and entrance ways to make inspection easy.

To facilitate increasing size when desired, standard units are used in the building of the baghouse, inlet expansion chamber and hoppers.

Standard 16 gauge, galvanized steel panels, reinforced at the ends by angles joined by double floor construction made air tight by the insertion of paper sealing strips are used in the construction of the baghouse.

The flat bags covering the opening between the channels are seamed vertically every few inches to hold their nominally flat shape under suction. They are hemmed closed at the top and are supported by rods inserted in the hem and carried on the hook end of the special turnbuckles connected to the housing frame by appropriate springs, permitting replacement of a bag in less than ten minutes, according to the manufacturers.

Adjustment of tension on the bags is governed by the eye end of the turnbuckle. A shaking bar passes through the center of each row of turnbuckles. When these rods are oscillated by the motor-driven shaking device, the bags are shaken without disturbing the bag adjustment.

New Stearns Idler Features Strength

A new Rex-Stearns belt conveyor carrier has just been announced by the Stearns Conveyor Company of Cleveland, Ohio, for mounting their pressed steel and chilled rim cast iron idler units.

The supporting brackets are made of certified malleable iron, and by the redistribution of the metal, a strong bracket has been worked out.

The spacing between idlers is reduced to 5/16-inch on this new Rex-Stearns carrier.

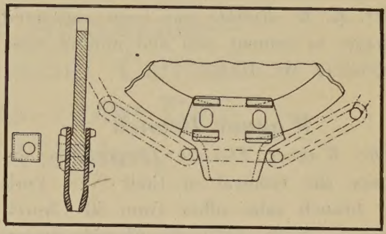
The carrier is offered in the following sizes: 18- 20- 24- 30- and 36-inch, with either Rex-Stearns pressed steel or chilled rim cast iron idlers, both having one-piece pulley shell construction, Timken bearings, long time lubrication, and the Stearns positive grease seal which serves the double purpose of keeping dust out of the idler and grease within it.

The new idler is interchangeable with previous Stearns units.

New Union Expansible Tooth Sprocket

A device for prolonging the life of sprocket chain as well as sustaining high efficiency of operation throughout its entire life, has been developed by the Union Chain & Mfg. Co. of Sandusky, Ohio.

This is a specially designed expansible sprocket, the teeth of which may be adjusted from time to time to accommodate the natural wear and consequent elongation of the links of a chain. This elongation, though seemingly slight in any one link, is multiplied by the number of links in engagement with the sprocket, causing a misfit between chain and sprocket and a consequent jerky and noisy action; this shortens the life of both chain and sprockets, more or less power is wasted, and the trouble naturally increases with each day's wear in the chain bearings.



American Cable Company Develops a Flexible Bolt

Through the development of the preformed type of wire rope which makes possible the attachment of fittings by the processing method that compels the fitting to become an integral part of the rope, the American Cable Company has recently perfected the Tru-Lay—Tru-Loc flexible bolt.

These new bolts are finding ready acceptance as auxiliary hangers for power shafts, suspension brackets for overhead steam or water piping, and so forth.

The principle on which the new flexible bolt rests is the preformed type of wire rope. Preforming the wires and strands to the exact helical shape they must assume in the completed rope results in a cable that does not require seizing but may be cut like a rod. This type of rope permits a close fitting attachment to be slipped over the unseized end of the rope and to be processed so that the steel of the fitting cold flows into the interstices of the rope and thus becomes practically an integral part of it.

With the Manufacturers

NOTES FROM THE FIELD

Motor Division Created

The General Electric Company, Schenectady, New York, has made announcement of the creation of a motor division of its industrial department. The new division will have charge of all policies, prices, etc., regarding all motors handled by the *General Electric Industrial Department.*

Mr. F. M. Kimball has been appointed advisory manager, and *Mr. J. E. N. Hume,* manager.

Mr. K. H. Runkle has been appointed manager of cement mill and mining sales succeeding Mr. Hume.

Wagner Branch

The Wagner Electric Corporation announce the removal of their New York City branch sales office from 50 Church Street to Suite 1110, 30 Church Street. The New York City service station remains at 321 W. 54th Street.

Splitdorf Subsidiary

The American Electric Motor Company, Cedarburg, Wisconsin, has recently become a subsidiary of the Splitdorf-Bethlehem Electrical Company, Newark, N. J. In addition to the American Electric Motor Company the Splitdorf Company controls the Splitdorf Radio Corp., Splitdorf Company of Canada, Splitdorf Electrical Company, Splitdorf Manufacturing Company and the Perfection Appliance Company.

The American Electric Motor Company, in its new modern plant at Cedarburg, will continue to manufacture a self-ventilated polyphase induction motor from ½ to 125 h.p.

W. R. Davis has been appointed general manager of the American Motor Company; W. M. Sprinkman will have charge of industrial sales.

Bag Representative

J. I. McCants, for many years identified with the cement industry in the South, has recently become affiliated with the sales organization of the *Bates Valve Bag Corporation* and will represent the company in the South, as southern sales manager.

For twelve years, Mr. McCants was connected with the old Standard Portland Cement Company at Birmingham as general sales manager. After a brief absence he reentered the cement business as general sales manager of the Signal Mountain Portland Cement Company at Chattanooga.

Combustion President

George E. Learnard, president of the *International Combustion Engineering Corporation,* 200 Madison Avenue, New York, announces the resignation of *Joseph V. Santry* as president of the *Combustion Engineering Corporation,* an American subsidiary of the *International Combustion Engineering Corporation,* and the election of *H. D. Savage,* for many years vice-president, as president to succeed Mr. Santry.

Traveling Sales Manager

The D. O. James Manufacturing Company, Chicago, announce the addition to their sales department of *R. C. Bird,* in the capacity of traveling sales manager.

Mr. Bird, formerly with the Chain Belt Company of Milwaukee, has spent some twenty years in working with power transmission equipment, and will be available to those interested in securing speed reducers for specialized jobs.

Schaffer Sales Manager

H. A. Schaffer has joined the *Bates Valve Bag Corporation* as eastern sales manager. He was formerly conservation engineer for the Portland Cement Association.

Details will be found in the Men and Mills pages of this issue.

A-C Representatives

Allis-Chalmers Mfg. Co., Milwaukee, announces the appointment of *R. T. Stafford,* formerly district manager of the Seattle office, as assistant manager of the electrical department in charge of sales and engineering at Pittsburgh transformer works.

John Alberts of the Seattle office has been appointed district manager, succeeding Mr. Stafford. The Seattle district embraces the states of Washington and Oregon, having a branch office located at Portland.

INDUSTRIAL LITERATURE

Dumper Literature

Bulletin 103 issued by the *Roberts and Schaefer Company,* Chicago, is devoted to *Rotary* car dumpers. All features are taken up, and many are illustrated in actual operation.

Screw Conveyor Book

An 85-page book, No. 989, devoted entirely to screw conveyors, fittings and accessories has been issued by the *H. W. Caldwell & Son Company,* Chicago, Ill. This is a revised list price book, a section of *Catalog* 500.

The *Helicoid* type of screw conveyor flight is given prominent place.

New Hammermill Catalog

The Dixie Machinery Manufacturing Company, of St. Louis, has issued a new catalog on the *Dixie Hammermills.* The catalog points to the non-clog feature of the specially designed, continually moving breaker plate designed to solve the problem of reducing soft and sticky materials. This is said to be an exclusive feature.

The new catalog presents complete information as to the Dixie non-clog hammermill, the Dixie Standard Mogul, and the Dixie Mogul Jr.

A-C Motors

The Allis-Chalmers Company, Milwaukee, Wisconsin, has recently issued *Bulletin* 1143, on line-start induction motors. Type ARX having sleeve or roller bearings, is described.

Study of Reducer Problems

The Link-Belt Company has made a study of conditions contributing to the selection of the right speed reduction unit and has made an analysis of problems involved. These are compiled and solved in an article entitled "Some Reasons for the Increasing Popularity of Speed Reducers," by L. P. Spillan.

Steam Control Publications

The C. J. Tagliabue Manufacturing Company, Brooklyn, New York, is distributing two publications on the subject of steam control. The first is that describing a new system of automatic control, in which steam controls itself with its own power, maintaining the correct temperature or pressure in equipment. This publication is a broadside containing diagrams, photographic illustrations and descriptive matter.